STIC Search Report
EIC 2100

STIC Database Tracking Number: 132338

TO: Diane Mizrahi **Location: 4D32** **Art Unit : 2175** **Tuesday, September 14, 2004** **Case Serial Number: 09/896238**	**From: Carol Wong** **Location: EIC 2100** **PK2-4B33** **Phone: 305-9729** **carol.wong@uspto.gov**

Search Notes

Dear Examiner Mizrahi,

Attached are the search results (from commercial databases) for your case.

Color tags mark the patents/articles which appear to be most relevant to the case. Color of tag has no significance. Pls review all documents, since untagged items might also be of interest. If you wish to order the complete text of any document, pls submit request(s) directly to the EIC2100 Reference Staff located in PK2-4B40.

Pls call if you have any questions or suggestions for additional terminology, or a different approach to searching the case. Finally, pls complete the attached Search Results Feedback Form, as the EIC/STIC is continually soliciting examiners' opinion of the search service.

Thanks,
Carol

PATENT INFORMATION USERS GROUP, INC.
The International Society for Patent Information

Software Tools for Analyzing Patents

By Anthony Trippe, tony_trippe@vpharm.com, April 1999

The analysis of patent information can mean a number of different things, as can the concept of patent mapping. In general, patent analysis involves extracting data from a patent document (could be any type of literature for that matter) and analyzing the data by different criteria. The type of map that is created depends upon the question that is trying to be answered.

From my understanding, this analysis can be divided into two broad categories. These are data mining (or mapping) and text mining. Data mining involves the extraction of fielded data and the analysis thereof. An example would be if someone wanted to examine the relationship between patent assignees and International Patent Classification codes for a specific area of technology. Mining or mapping this information can give someone an idea of who are the major players in a technology area and what type of work they are generally focusing on. When using Derwent data, a similar analysis can be done replacing IPC codes with Derwent manual codes.

Text mining or mapping typically involves clustering or categorizing documents based on the major concepts that are contained within. The data source is unstructured text data, it is not fielded and the only structure is that which the author has applied when they wrote the document and built relationships between different concepts within. An example of this would be if you collected patents from a specific patent assignee and you analyzed the text of these documents. In a cluster map the software would extract the major concepts found within and create clusters of documents that appear to cover the same concept. The software would then visualize these clusters in some fashion creating a map. By looking at the clusters that were created (and subsequently the documents themselves, but now with an organized method) you can quickly get a general idea of the concepts that this organization is working on and how they interrelate.

Manning & Napier's MapIT: When someone purchases access to this system they are given a login id and password for accessing M&N's internet site. Care should be taken that you have logged in using a secure link to the site. All of the work is done remotely on M&N's servers. There are advantages and disadvantages to this. M&N have collected patent data from US, EP and PCT applications and granted patents (the general rules on years covered apply to this system) and the first step in using MapIT is to construct a search query using their natural language search system. M&N will advice that this query should be as specific as possible and contain as many synonyms as you can think of (they suggested using the first claim of a patent for instance). The system will retrieve the first 1,000 patents that meet your search criteria. There is some flexibility on weighing whether your search terms appear in different areas of the patent full-text but I will not go into that here.

Once you have generated a list of documents you can choose to start reading the documents or you can apply a couple of different analysis tools to the set. The cite sort option allows you to do some rudimentary data mining on the set. This feature will create graphs of the first 100 patents based on the inventors, patent assignees, USPC class and sub-class. This data is given as is and the user is not allowed to customize this data or look at other data fields.

The other major tool is called IBM clustering and as the name implies this allows you to cluster the documents based on the system developed by IBM (This is available in a stand alone package from them called Technology Watch. Technology Watch has options for doing both data and text mining). When the system is finished analyzing the patents it will create a list of clusters categorizing the documents.

Overall, MapIT is an easy system to use and is a good general tool for patent mining or mapping. For more advanced users, the lack of customizable features may be frustrating.

Semio: This is pretty much a text mining tool that creates cluster maps based on a set of documents. Once the system is installed it is fairly easy to create a map from it and post the map to an intranet site so that a number of people can share the information. A standard web browser is used to look at the maps and after a short introduction to how the maps work a user can quickly and easily start using the system. One large drawback is that for Semio to work most effectively individual documents must be created for each reference. For example if you were downloading data from Derwent for analysis, you would have to create a separate document for each Derwent record. Otherwise when you saw a concept you were interested in and wanted to look at the documents in that cluster, the system would return the entire online record. In other words, the system does not contain a feature where online data can be imported in and parsed into separate records for analysis.

Overall, Semio is one of the more attractive visualization packages out there for doing concept mapping (text mining).

Aurigin's IPAM system: IPAM stands for Intellectual Property Asset Management and as the name implies this system allows you to organize and manage intellectual property (not just patents, but corporate documents as well). The system contains tools for patent analysis as well since this is an integral part of smart IP management. While a very interesting system, Aurigin is a big ticket item. There are substantial costs involved in purchasing a server to run the system and setting it up to work within an organization. It offers a great deal of power, flexibility and security (since it is located behind your company's firewall) but it is not trivial to get established.

IPAM is an integrator system meaning that they have built a platform for the system and have allowed it to be flexible enough to allow a number of third party applications to work within the framework. Aurigin invited some of the best third party analysis tools companies to partner with them and integrate their systems in with Aurigin. They have incorporated both text and data mining tools into the system and set them up so that they all work together seamlessly.

The patent data is taken from US, EP and PCT documents (same basic rules apply for coverage) and they also have a method for searching these references and creating sets that can be further analyzed. Another nice feature is that since Aurigin began life as SmartPatents, you can have all of the annotation and viewing capabilities of SmartPatents accessible through the system (for an additional charge of course to purchase the SmartPatents of interest). One of the key strengths of the IPAM system is the ability for individuals within an organization to create sets of patents, analyzed them, annotate them and generally create intelligence from them and save all of this knowledge in a single place where it can be preserved for the company.

Overall, this is a nice system but a big investment.

SmartCharts for Patents: Produced by BizInt, this software allows a user to import Derwent data from the WPI file on STN into the system and create tables of information (including the Derwent images) from it. While not a text or data mining tool per se, the software is very good for formatting Derwent data to be shared with a client. The tables are customizable and additional columns can even be added for keeping track of comments made by people working with the tables. For more information and to see some examples of the tables go to: http://www.bizcharts.com/sc4pats

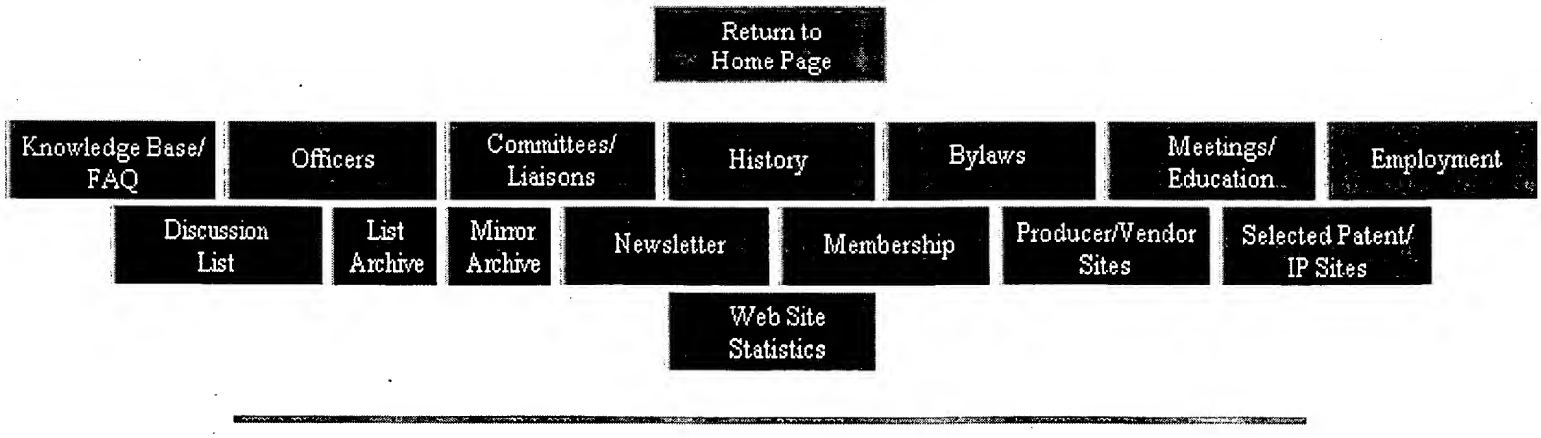
The IBM Intellectual Property Network for Business: IBM is making some big changes to their site and they have already but some tools for patent citation analysis up on their site. Nancy Lambert, in her "Better Mousetrap" column (Searcher Magazine, March 1999) wrote a fairly extensive review of this site so I will recommend that interested individuals contact Nancy for reprints or order a copy of the column. As I mentioned in the last note, IBM is also selling an integrated data and text mining tool called Technology Watch. I do not have a lot of data on this tool yet so I will refer the reader to IBM's web site where a search for Technology Watch will bring up some information on the product.

ThemeScape by Cartia: This is a text mining tool with a few built in data mining features that enhance the clustering aspect. This company has partnered with Aurigin so ThemeScape can be used in conjunction with the Aurigin IPAM system. As I mentioned last time, Semio creates concept maps that show each level of detail as a separate map page. You start with the view from the highest level (the concepts that appear most frequently) and as you mine into the map you get greater detail with separate maps. ThemeScape takes the topographical map approach where the most common clusters are seen as mountain tops and you get greater detail by moving down the sides of the mountain towards the valleys. It incorporates a data mining aspect since you can ask that a specific patent assignee be identified on the map. This takes the form of small dots on the map. Where you see a dot, that is a concept area where that patent assignee is working.

In the last few years, this area has exploded and there are now a number of interesting products that can make the tedious task of mining patent data easier than it was in the past. If there are questions or comments, please do not hesitate to contact me. I can be reached at tony_trippe@vpharm.com.

Please send comments, corrections, information or suggestions for the PIUG webpages to the PIUG Webmaster.

October 2002 / Web Page Committee / Jing Belfield



www.bereskinparr.com/publications

Fall 2004

Fall 2004

Update

Software/High Technology Practice Group Newsletter

Building a Software Patent Portfolio – Key Business and Legal Considerations

Software patent portfolios are not immune to budget constraints brought on by the challenging business environment facing software companies today. To develop an effective and economical patent portfolio building strategy, a software company must determine in which jurisdictions it makes best business sense to seek patent protection, which inventions to select and when to file applications.

Strategic Country Selection

The United States was the first country to formally recognize the patentability of software in the 1981 United States Supreme Court ruling in *Diamond v. Diehr*, 450 U.S. 175 (1981) at 185 (U.S.S.C.). This case established that computer-related machines and processes were not to be regarded any differently under the patent laws than traditional machines and processes.

In Europe, software inventions must possess "technical character" in order to be considered patentable subject matter. In Japan, the test is whether the information processed by the software is "concretely realized" by using hardware. In Canada, software inventions must have a "practical application in industry, trade or commerce". The Canadian Patent Office is planning to introduce new Guidelines later this year to provide clarity on the Canadian test for software patentability.

While the international landscape on software patents is still evolving, it is clear that software inventions are considered patentable subject matter in many jurisdictions. Accordingly, it is useful to develop a list of "target" countries in which patent protection is to be sought. To create the list, a two-step process may be followed.

First, a "wish list" may be compiled by looking at factors such as: (i) key current markets; (ii) future target markets; and (iii) markets where competitors have extensive operations. Typically, the "wish list" will generate a larger number of countries than a reasonable budget will permit. Countries may be removed using factors such as: (i) unavailability of patent protection due to disclosure or subject matter bars; (ii) poor enforcement of patent rights; or (iii) cost of obtaining patent protection outweighs potential benefits.

Selecting Software Inventions

One important business consideration is whether a particular software invention has long term potential value. Since it typically requires two to three years to obtain an issued patent, there is little reason to expend resources on protecting software that is likely to be obsolete by the time the patent issues.

continued on reverse

We are very pleased to announce the two newest members of the Software/High Technology Practice Group.

Neil Henderson B.A.Sc., (Eng. Sci.), LL.B.
Neil is a senior associate and practices out of the firm's Waterloo office. His practice focuses on strategic IP portfolio creation and management including advising on patent and trade mark prosecution, providing opinions on patentability, validity and infringement, and handling the IP aspects of all types of business transactions. Particular technologies of interest include the mechanical, optical, electro-mechanical, medical, communications, software and Internet areas. Neil also advises clients on IT/copyright law, including software licensing, distribution and outsourcing.

Ebad Rahman B.Sc. (Comp. Sci.), LL.B.
Ebad is an associate in the firm's Toronto office. He received his law degree from Osgoode Hall Law School and has a Bachelors degree in computer science. Ebad advises clients in matters relating to patents, with a focus on computer-related technology.

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Another factor concerns the specific business-related context in which the company is operating. The investment community often values start-up companies predominantly on their intellectual property holdings. Accordingly, a start-up tends to file a "kitchen sink" type patent application that covers many inventions in order to ensure that all potential patent rights are being preserved.

In contrast, a larger company tends to focus on inventions that relate to its core business, a targeted new business, or the business activities of its competitors (for defensive value). In larger companies, research departments often come up with inventions which have little to do with these targetted aspects. Such inventions should be carefully scrutinized.

When to File

Budget constraints can delay the filing of a patent application. Usually a company wants to ensure that the invention is commercially viable before going ahead with the costly process of obtaining patent protection.

However, in most countries, an invention is not patentable once an "enabling disclosure" has been made available to the public. An "enabling disclosure" is one which would allow a person skilled in the art to build the invention. The United States and Canada provide a one-year grace period in which to file a patent application from the date of an enabling disclosure.

Also, it is possible to obtain patent protection for a software innovation even after commercialization, as long as the innovation cannot be inferred from the commercially available product. However, if the software invention has been in public use or on sale for more than one year in the United States, then it is not possible to obtain patent protection in the United States even if the software invention has not been disclosed by such public use.

These two factors create a tension that may be addressed in two different ways.

A patent application could be filed in a jurisdiction of the company's choice prior to any public disclosure of the invention. Thereafter, international treaties provide the opportunity of deferring national filing costs for one year or more. This strategy preserves the right to seek worldwide patent protection within the convention year.

For those who only conduct business within the United States and Canada, another approach would be to file a patent application in the United States and Canada within one year of public disclosure, public use or sale of the invention. It should be borne in mind that by filing an application after disclosure, the ability to obtain patent protection in most countries outside the United States and Canada is lost.

Speaking of IP....

We are speaking and participating in a number of upcoming conferences and seminars. We hope to see you at one of them!

Stephen Beney of Bereskin & Parr will be participating in a patent panel entitled "Comparative Approaches to Software and Business Method Patents: Canada, U.S. & Europe" at the Intellectual Property Institute of Canada's Annual Meeting, October 14th to 16th in Banff, Alberta. For more information go to **www.ipic.ca**.

Bereskin & Parr is a proud sponsor of the Eighth Annual IT.Can Conference taking place in Calgary this October. Please join us at the continental breakfast taking place on Thursday, October 21st, 2004, at 8:00a.m. For more information go to **www.it-can.ca**.

Isis Caulder of Bereskin & Parr will be speaking on "IP Due Diligence" at a continuing education seminar hosted by Osgoode Hall Law School on October 27th entitled "Conducting Effective Corporate Due Diligence". For more information go to **www.law.yorku.ca/pdp/cle/**

Bereskin & Parr Presents:

From Inception to Profit – Advanced Intellectual Property Issues

October 21, 2004 – Waterloo
October 28, 2004 – Mississauga
November 2, 2004 – Toronto

Intellectual Property - Auditing and Valuing an IP Portfolio

December 2, 2004 – Waterloo
December 7, 2004 – Mississauga
December 9, 2004 – Toronto

For more information and on-line registration please go to **www.bereskinparr.com.**

Edited by **Isis E. Caulder**. Please send feedback and suggestions for future topics to Isis at icaulder@bereskinparr.com.

The article titled "Building a Software Patent Portfolio – Key Business and Legal Considerations" was authored by **Victor Krichker**. Any questions regarding the article can be forwarded to Victor at vkrichker@bereskinparr.com.

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132338

#53

STIC EIC 2100
Search Request Form

Today's Date:

What date would you like to use to limit the search?

Priority Date: 6-29-01 Other:

Name Diane Mizrahi

AU 2175 Examiner # 74016

Room # 4032 Phone 305-3806

Serial # 09/896,238

Format for Search Results (Circle One):

(PAPER) DISK EMAIL

Where have you searched so far?

(USP) DWPI (EPO) (JPO) ACM (IBM TDB)

IEEE INSPEC SPI Other _____

Is this a "Fast & Focused" Search Request? (Circle One) (YES) NO

A "Fast & Focused" Search is completed in 2-3 hours (maximum). The search must be on a very specific topic and meet certain criteria. The criteria are posted in EIC2100 and on the EIC2100 NPL Web Page at http://ptoweb/patents/stic/stic-tc2100.htm.

What is the topic, novelty, motivation, utility, or other specific details defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, definitions, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract, background, brief summary, pertinent claims and any citations of relevant art you have found.

- intellectual property or patents
- searching or querying scientific/engineering publications
- technology exchange
- problem solving, knowledge based or intelligent
- electronic patent valuation system
- "prediction of model mapping of value, trend, existence of intellectual property or patents"
- (automatic + simultaneous real-time) produces a model map
- model map, contains topographical features: colors, number, symbols representing intellectual property value and increasing/decreasing values of intellectual property value

STIC Searcher C. Arm Phone 305 9129

Date picked up 9-13-07 Date Completed 9-14-07

sira Search and Information Resources Administration

sugen

PROJECTS
C. elegans
S. cerevisiae
Human
Mouse
Drosophila
Comparative Kinomics

TOOLS
KinBase
Blast
HyperTree
Sequence Download

HOME

Tree Viewer

HYPERTREE is a tree viewer that supports circular and linear trees.

features | demo version | usage tips | request full version

Features

HyperTree includes many features for navigating large trees, such as the ability to:

- visualize **large trees** with hundreds of nodes or more
- **rotate** and **drag** the display in cartesian space
- **search** and **select** nodes
- **copy clusters** for pasting into other programs
- **color-code** branches
- **label** branches (eg, common family members)
- **zoom** in and out
- view phylogenetic trees and other hierarchical clusters, such as gene expression profile clusters
- run on **several platforms**: Windows, Unix and Linux (Mac support will hopefully be available soon)

Download Demo Version

This is a limited demo version of HyperTree. It displays *C. elegans* protein kinases.

To try HyperTree, follow these three steps:

1. Install Java 2
2. Download HyperTree
   (NOTE: If the download causes an error message about a "corrupt jar file", right click on the link and save from the popup menu instead. The error message is a bug in some browser versions.)
3. Run it! On Windows you can run the program by double-clicking on the file name. On Unix or Linux, you can launch the viewer by navigating to the download directory and typing

```
java -jar HyperTree.jar
```

Enjoy!

Usage Tips

Currently no comprehensive usage manual exists for HyperTree. However, here is a brief summary of 'non-obvious' features.

Mouse Controls

- To rotate the tree, drag while holding down the shift key.

Reading and Writing Tree Files

- The demo version of HyperTree displays a tree of *C. elegans* protein kinases. It cannot save modifications to this tree or open any other tree files
- HyperTree reads and saves trees in Phylip format
- It displays one tree at a time; if a file contains multiple trees, only the first tree will be displayed.

Selecting Nodes and Branches

- Labels appear on mouseover
- Click a label or node to select it
- Hold down the "SHIFT" or "CTRL" key when clicking to add multiple selections
- Select an internal node and then choose "Select Children" to select an entire subtree
- Click "Copy" or "CTRL C" to copy all selections to the system clipboard. Then you can paste them into other programs, such as the data retrieval tool.

Colorizing the Tree

- Choose "Color" to change the color of all selected labels and nodes
- Choose "Export Colors" from the "File" menu to save the colors
- You can create a color file independently of HyperTree. To import a color file, choose "Import Colors" from the "File" menu
- A valid color file has the following format:

```
nodeLabel1  color1
nodeLabel2  color2
```

Node labels are case-sensitive. They must exactly match the labels in the tree. Node labels are separated by white space from the color.

- Colors can be specified in the color file in one of three ways. A color can be either an RGB value, a color name in plain English using any of the standard color names recognized by Netscape and Internet Explorer; or an arbitrary identifier, in which case HyperTree will attempt to automatically assign a color by default. E.g.,

```
ZC123.4   darkGreen
ZC239.7   0,0,255
ZC373.4   tyrosineKinase
```

Request Full Version

Instructions for Licensing of HyperTree Software

Up to recently, HyperTree could be licensed for non-profit and for-profit use. However, Sugen has since been shut down as part of the rationalization after the Pfizer takeover of Pharmacia (Sugen's parent company). The program now belongs to Pfizer, and we are working on making the software available to the scientific community again.

For more information please contact us.

June 01, 1998, TechWeb News

Xerox subsidiary releases Hyperbolic Tree technology for licensing-- InXight user interface adds XML to 3-D Web

By Bernard Cole

PALO ALTO, Calif. - Xerox Corp. subsidiary InXight Software Inc. is continuing its drive to make Xerox' Focus+Context user interface the industry standard for visualizing complex information on PCs, databases and the World Wide Web. In its latest move, InXight has released a powerful new version of its Hyperbolic Tree component technology for licensing to developers.

The upgrade incorporates the Extensible Markup Language (XML)-the follow-on and complement to the Web's Hypertext Markup Language (HTML) format-and defines a Document Type Definition (DTD) that will let developers customize the user interface for any application that requires visualizing, organizing and navigating through large amounts of information.

Hyperbolic Tree Version 2.0 builds on the success Version 1.2-which provided 3-D-like displays of hierarchical relationships for Web-site management-by enabling more complex, non-hierarchical structures to be shown on a PC's user interface. Hyperbolic Tree displays documents, data and their organizational relationships in 3-D-like structures that present smooth, animated transitions as users navigate the system.

The approach is radically different from conventional, 2-D graphical user interfaces, such as Microsoft Windows 95, the more Net-friendly Windows 98 and such proposed network-user-in-terface successors as Netscape's Constellation, SCO's Tarantella, Oracle's WebTop, Sun's HotJava Views, IBM/Lotus' Kona Desktop and IBM's Bluebird. All of those next-generation interfaces simplify the interface by eliminating the choices a user can make.

Rather than eliminate choices, the Focus+Context technology-patented by the Xerox Palo Alto Research Center (Parc)-enlarges areas to which the user points while retaining fisheye-like contextual views of surrounding "nodes," or representations of folders, documents and data. Unlike traditional navigational methods, such as clicking through pages on a Web site, Hyperbolic Tree interfaces let users know at all times where they are in relationship to the overall data set.

"It is much like the way a human views the real world, not through a window but by viewing in detail what is the center of attention and retaining a fuzzy representation of what is on the periphery," said senior product-marketing manager Barry Engel. The user thus focuses on the area of interest but is not confined "to one particular view."

Version 2.0 extends the available range of icons and graphics, letting developers customize the interface to present visual cues that help users more easily and quickly identify the nature of underlying content. For example, in a network-management application, Hyperbolic Tree 2.0 could provide a complete overview of all nodes on the network, letting managers easily scan and effectively drill down to items of interest. Relationships of clients to multiple servers-and problems at any of the client or server nodes-are indicated through a variety of graphic and color codes.

Network activity, too

Similar techniques are used to represent network activity, giving managers an interactive view of network traffic that lets them better map and analyze flow between clients and servers for bandwidth-needs forecasts.

"The initial release of Hyperbolic Tree transformed Web-site development and management," said Ramana Rao, chief technology officer and director of engineering for InXight. "Products from Microsoft and SoftQuad, which integrate InXight components, have created a more intuitive environment in which vast Web sites are easy to visualize."

In addition to support of C, C++ and Java, Version 2.0 is available as ActiveX and Java Beans object technology for use in such development environments as Visual Basic, PowerBuilder and Symantec Visual Cafe.

According to Engel, data can be presented by the Hyperbolic Tree either as a true hierarchical tree or in directed graphs, which depict non-hierarchical structures. Graphs within the Hyperbolic Tree framework are transformed into either an equivalent tree or a set of trees, to represent multiple parentage of nodes.

Support for XML

But the most important enhancement to Hyperbolic Tree, according to Engel, is its support for XML, the emerging data-representation standard for describing relationships among large sets of data on the Web. That opens the way for Xerox' pioneering Focus+Context visualization technique to become the standard for navigating the Web in the same way the Xerox-developed WIMP (windows, icons, menu and mouse/pointer) interface approach has become the standard on the desktop.

Xerox did not gain commercially from the popularization of the WIMP GUI. But InXight's licensing of the Focus+Context technology should ensure that the revenue opportunity is not lost this time around, Rao noted.

Among other licensing arrangements, Hyperbolic Tree has already been used as the foundation technology for Web-site-development and -management software in the popular Microsoft Site Server and SoftQuad HoTMetaL Pro products. It has also been licensed by Comshare Inc. for use in Comshare Decision, a tool used within closed intranet and database applications to visualize and manage huge amounts of data. About 20 developers are said to be in various stages of product development with the Hyperbolic Tree component package.

With the addition of support for XML as well as Java, JavaBeans and Active X, the way is open to developers to design navigation tools for the Web that are not limited to particular Web sites or databases. That is because XML provides mechanisms for adding so-called "metadata" to information in a database or particular Web site that is readable across diverse hardware and software platforms.

Until the inception of XML, said Engel, sophisticated, 3-D-based Focus+Context visualization tools were limited to use on individual Web sites and databases because of the lack of

a common metadata format across the Web. Large repositories of information were often formatted and organized in unique ways, employing information tied to each file-metadata-that allowed users inside the database to access information in ways that were not possible to users accessing it through the Web.

"As XML, rather than HTML, becomes the common language of the Web, the average user will be able to use such advanced 3-D visualization techniques to navigate more easily throughout the Internet," Engel said.

Hyperbolic Tree Version 2.0 will be available to application developers and system integrators this month as component object technology, packaged as ActiveX for the Windows platform. An updated Java and Java Beans version will be available later in the summer.

For more information, call (650) 852-0290, e-mail info@inxight.com or access www.inxight.com.

```
File   9:Business & Industry(R) Jul/1994-2004/Sep 10
         (c) 2004  The Gale Group
File  13:BAMP 2004/Sep W1
         (c) 2004  The Gale Group
File  16:Gale Group PROMT(R) 1990-2004/Sep 13
         (c) 2004 The Gale Group
File  47:Gale Group Magazine DB(TM) 1959-2004/Sep 10
         (c) 2004 The Gale group
File  88:Gale Group Business A.R.T.S. 1976-2004/Sep 10
         (c) 2004 The Gale Group
File 148:Gale Group Trade & Industry DB 1976-2004/Sep 10
         (c)2004 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
         (c) 1999 The Gale Group
File 275:Gale Group Computer DB(TM) 1983-2004/Sep 13
         (c) 2004 The Gale Group
File 570:Gale Group MARS(R) 1984-2004/Sep 13
         (c) 2004 The Gale Group
File 621:Gale Group New Prod.Annou.(R) 1985-2004/Sep 10
         (c) 2004 The Gale Group
File 636:Gale Group Newsletter DB(TM) 1987-2004/Sep 13
         (c) 2004 The Gale Group
File 649:Gale Group Newswire ASAP(TM) 2004/Sep 07
         (c) 2004 The Gale Group

Set     Items   Description
S1    6956205   WORTH? OR VALUE? ? OR VALUATION? OR VALUING OR PARVALUE? OR
             MARKETVALUE? OR STREETVALUE? OR FACEVALUE?
S2      21448   S1(3N)(PATENT? OR IP OR INTELLECTUAL()PROPERT?)
S3       8484   S1(3N)(COPYRIGHT? OR COPY()RIGHT??? ? OR TRADEMARK? OR TRA-
            DE()(MARK? ? OR MARKED OR MARKING))
S4    9877320   SCIENTIFIC OR RESEARCH OR ENGINEERING OR TECHNICAL
S5    3349792   CHEMICAL OR BIOTECH? OR HIGHTECH? OR (HIGH OR HI)()TECH
S6     492513   S4:S5(3W)(DATA OR INFORMATION OR NPL OR DISSERTATION? OR L-
            ITERATURE OR MONOGRAPH? OR PUBLICATION? OR ARTICLE? ?)
S7      31591   S4:S5(3W)(BOOK? ? OR TEXT? ? OR TEXTUAL OR TEXTBOOK?)
S8    1488633   MAP OR MAPS OR MAPED OR MAPPED OR MAPING? ? OR MAPPING? ? -
            OR TOPOGRAPH? OR CHART? ? OR CHARTED OR CHARTING? ? OR CHOROG-
            RAPH?
S9    1895924   CARTOGRAPH? OR GRAPH OR GRAPHS OR GRAPHIC?
S10      2989   S1(3N)S6:S7
S11       342   (S2:S3 OR S10)(S)S8:S9
S12    114763   S1(5N)(MODEL??? ? OR MODELL??? ? OR PREDICT? OR FORETELL? -
            OR FORECAST? OR FORE()(TELL??? ? OR CAST??? ?) OR PROSPECTIVE-
            ?)
S13    187814   S1(5N)(ESTIMAT? OR PROGNOS? OR SPECULAT? OR PRESAG??? ? OR
            PROBABILIT? OR VATICINAT? OR FORSEE? OR FORTELL? OR FORCAST? -
            OR PREVIS?)
S14     90579   S1(5N)(PROPHES? OR PROJECT? ? OR PROJECTED OR PROJECTING OR
             EXTRAPOLAT?)
S15        28   S11(S)S12:S14
S16         9   S15/2002:2004
S17        19   S15 NOT S16
S18        14   RD (unique items)
S19  13612956   GROW??? ? OR EXPAND? OR EXPANSION? OR VOLUME OR TREND?
S20     41664   S19(3N)(PATENT? OR IP OR INTELLECTUAL()PROPERT?)
S21     13452   S19(3N)(COPYRIGHT? OR COPY()RIGHT??? ? OR TRADEMARK? OR TR-
            ADE()(MARK? ? OR MARKED OR MARKING))
S22      7034   S19(3N)S6:S7
S23    656340   S19(5N)(MODEL??? ? OR MODELL??? ? OR PREDICT? OR FORETELL?
            OR FORECAST? OR FORE()(TELL??? ? OR CAST??? ?) OR PROSPECTIVE-
```

```
            ?)
S24     157300   S19(5N)(ESTIMAT? OR PROGNOS? OR SPECULAT? OR PRESAG??? ? OR
              PROBABILIT? OR VATICINAT? OR FORSEE? OR FORTELL? OR FORCAST?
             OR PREVIS?)
S25     308674   S19(5N)(PROPHES? OR PROJECT? ? OR PROJECTED OR PROJECTING -
             OR EXTRAPOLAT?)
S26        678   S20:S22(S)S8:S9
S27         32   S26(S)S23:S25
S28          4   S27/2002:2004
S29         28   S27 NOT (S28 OR S15)
S30         17   RD (unique items)
S31     109601   MEDICAL(3W)(DATA OR INFORMATION OR NPL OR DISSERTATION? OR
             LITRATURE OR MONOGRAPH? OR PUBLICATION? OR ARTICLE? ?)
S32      10509   MEDICAL(3W)(BOOK? ? OR TEXT? ? OR TEXTUAL OR TEXTBOOK?)
S33       1464   (S1 OR S19)(3N)S31:S32
S34         28   S33(S)S8:S9
S35          4   S34/2002:2004
S36         20   S34 NOT (S35 OR S15 OR S27)
S37         12   RD (unique items)
?
```

18/3,K/1 (Item 1 from file: 9)
DIALOG(R)File 9:Business & Industry(R)

3099868 Supplier Number: 03099868
Getting a Grip on Intangibles
(There were 158,118 patents issued in 2000, and over 245,000 patents and published applications expected in 2001; licensing deals increased to over $100 bil in 1998 from about $15 bil in 1990)
Chemical & Engineering News, v 79, n 14, p 26+
April 02, 2001
DOCUMENT TYPE: Journal ISSN: 0009-2347 (United States)
LANGUAGE: English RECORD TYPE: Abstract

ABSTRACT:
...to the Licensing Executives Society, about one-third of companies have formal processes to determine **IP** portfolio **value** . Licensing income at IBM has increased over 30-fold during 10 years. The company invested...

...industries were worth about $15 bil in 1990 and exceeded $100 bil by 1998. Untapped **value** is **estimated** at $3-$5 trillion. More companies are considering licensing organizations to be profit centers. Companies...

...marketplace, has 25,000 registered users and about 400 listing technology subscribers. According to a **chart** of the hottest chemical technologies, by market valuation, titanium dioxide is first, with intangible asset...

18/3,K/4 (Item 1 from file: 13)
DIALOG(R)File 13:BAMP

1054629 Supplier Number: 01123149 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Assessing the Value of Your Technology (Part 2 of 3)
(In this portion of the article, a table is provided that lists and describes the metrics of the Technology Value Pyramid for innovation)
Article Author(s): Tipping, James W; Zeffren, Eugene; Fusfeld, Alan R
Research Technology Management, v 38, n 5, p 26-33
September 1995
DOCUMENT TYPE: Journal ISSN: 0895-6308 (United States)
LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 3716

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
Assessing the Value of Your Technology
Technology Value Pyramid Menu of Metrics
Legend for **Chart** :
A - Metric/Factor
B - Definition
C - Comments
A
B
C
1. Financial return/VC
a...

...development, process development and R&D expenditures.
This should be straightforward in most firms.
2. **Projected value** of the R&D pipeline/VC, PA
a. **Projected** Sales **Value** from Pipeline
Fraction of future sales by year projected from projects in the R&D pipeline, incorporating probability of attaining objective for each **project** .
b. **Projected** Income **Value** from Pipeline
Fraction of future net income (and/or return) by year projected from projects...

...attaining objective for each project.
Most companies attempt to project future sales and income from **projects** in the pipeline; the cumulative **value** of these **projects** represents the **projected value** of the pipeline in total. Such projections must always be done with a careful understanding...different market segments to obtain an average ratio value.
The Economic Evaluation measure provides an **estimate** of the commercial **value** of a technology benefit in the firm's products, based on the proposition that the...

...comparison is likely to be
very difficult. The cycle time that should be measured and **charted** is the ...know-how or arrangements.
Sales of products under patent is another means of assessing the **value** of the **patenting** activity. Rigor is required to count only patents that truly protect the sales, and not...

18/3,K/5 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

05887582 Supplier Number: 53078580 (USE FORMAT 7 FOR FULLTEXT)
Ptech Releases Newest Generation of Enterprise Architecture Modeling Product.
Business Wire, p1238
Oct 13, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 530

... It provides a systematic approach for both business and technology professionals to use a single **graphical** interface to capture an enterprise's strategic intent, organizational structures, budgets, performance measures, processes, **value** -chain **models** , **technical** architectures, and **data** requirements. Framework provides complete support for OMG Unified Modeling Language (UML) 1.1, including Class...

...release is the FrameWork Enterprise On-line, which provides the ability to publish all model **graphics** with hot spots. Interested parties can view all the Framework models in their familiar Web...

18/3,K/6 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

05591956 Supplier Number: 48464333 (USE FORMAT 7 FOR FULLTEXT)
Semiconductors: Why Investors Can't Resist
Fieglein, Ashley; Marren, John
Electronic News (1991), p36
May 4, 1998
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1342

... like communications or 3D graphics, the common thread is that the winners all deliver high- **value** , highly defensible **intellectual property** (IP). IP is the "technology" embedded in a technology company. How this IP is delivered...

...the Internet or on a piece of silicon. The key issue is the uniqueness and **value** of the **IP** . The recent success of companies such as Rambus have captured the market's attention, and...

...companies emerge over the coming years. It is important to point out that a business **model** enhances or leverages the **value** of the **IP** , it does not create **value** by itself.
Chipless **Model** : Like a Software Company But Better
The typical chipless company derives its revenue from licensing...

18/3,K/10 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

10204617 SUPPLIER NUMBER: 20589736 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Semiconductors: why investors can't resist. (Industry Trend or Event)
Marren, John; Fieglein, Ashley
Electronic News (1991), v44, n2217, p36(2)
May 4, 1998
ISSN: 1061-6624 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1445 LINE COUNT: 00118

... companies emerge over the coming years. It is important to point out that a business **model** enhances or leverages the **value** of the **IP** , it does not create **value** by itself.
Chipless **Model** : Like a Software Company But Better
The typical chipless company derives its revenue from licensing...

18/3,K/12 (Item 3 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2004 The Gale Group. All rts. reserv.

03430048 SUPPLIER NUMBER: 06910177
The value of load research.
Gellings, Clark W.; Swift, Mark A.
Public Utilities Fortnightly, 121, n12, 32(5)
June 9, 1988
ISSN: 0033-3808 LANGUAGE: ENGLISH RECORD TYPE: CITATION

CAPTIONS: The path to **value** for load **research** **data** . (chart); Diminishing incremental **value** of load **research** **data** . (**graph**); **Forecast** uncertainty and capacity decisions. (chart); Net present values for alternative combinations of construction and load...

30/3,K/1 (Item 1 from file: 9)
DIALOG(R)File 9:Business & Industry(R)
(c) 2004 The Gale Group. All rts. reserv.

2117434 Supplier Number: 02117434 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Intellectual Property: A Look To The Future
(Global intellectual property licensing revenue for US firms totaled an estimated around $20 bil in 1997, vs $200 mil in 1980)
Asset Sales Report, v 12, n 14, p 1+
April 06, 1998
DOCUMENT TYPE: Newsletter; Industry Overview ISSN: 0894-6175 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 591

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...Since 1980, worldwide intellectual property licensing revenue for U.S. companies -- just one component of **patent** royalty revenues -- has **grown** from an **estimated** $200 million to about $20 billion in 1997, according to Price Waterhouse (see **chart**).

Owners of IP have become much more diligent and aggressive about policing and enforcing their...

30/3,K/2 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2004 The Gale Group. All rts. reserv.

09124630 Supplier Number: 79512757 (USE FORMAT 7 FOR FULLTEXT)
Price risk management for the 21st century. (Metal producers, price risk management strategies) (Statistical Data Included)
Waite, David
Mining Journal, v337, n8655, p277
Oct 12, 2001
Language: English Record Type: Fulltext
Article Type: Statistical Data Included
Document Type: Magazine/Journal; Trade
Word Count: 3370

... a second type of diagram. Each chart was converted into a grid, showing combinations of **IP** **growth** rate and LME stock levels (the two main drivers of the entire price structure). BME then treated each **chart** like a **map** , contoured with cash prices in US$/t or with forward contangos, expressed in US$/t/mth. Across each **chart** was then plotted the same track of **predicted** LME stocks and **IP** **growth** , month by month, through a complete business cycle.
The example that BME chose to demonstrate...

...but still high at 8%, and with LME stocks at 200,000 t. The BME **model** then indicates that slowing **IP** **growth** would depress prices to US$1,950/t by month

30/3,K/5 (Item 1 from file: 47)
DIALOG(R)File 47:Gale Group Magazine DB(TM)
(c) 2004 The Gale group. All rts. reserv.

04168356 SUPPLIER NUMBER: 15948873 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Competitive intelligence and social advantage. (The Library in Corporate Intelligence Activities)
Davenport, Elisabeth; Cronin, Blaise
Library Trends, v43, n2, p239(14)
Fall, 1994
ISSN: 0024-2594 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 6334 LINE COUNT: 00526

... G. M. (1961). The management of innovation. London, England: Tavistock Publications. Campbell, R. S. (1983). **Patent trends** as a technological **forecasting** tool. World Patent Information, 5(3), 137-143. Cawkell, T. (1991). Using the Science Citation...Harvard Business Review, 51(4), 28-36; 152-157. Huff, A. S. (Ed. . (1990). Mapping **strategic** thought. New York: John Wiley & Sons. Jacobi, G. (1992). Financial tools for competitive analysis. Competitive...

30/3,K/6 (Item 2 from file: 47)
DIALOG(R)File 47:Gale Group Magazine DB(TM)

03638369 SUPPLIER NUMBER: 12166547
Voxels: data in 3-D. (volume pixels offer a new way to represent the world and analyze data) (State of the Art)
Argiro, Vincent; Van Zandt, William
Byte, v17, n5, p177(5)
May, 1992
ISSN: 0360-5280 LANGUAGE: ENGLISH RECORD TYPE: ABSTRACT

...ABSTRACT: voxel is a volume pixel that offers a new way of looking at three-dimensional **graphics** : the voxel allows a user to sample the three-dimensional (3-D) space that an...

...a 3-D grid, and possesses a value that represents a sample of real-world **scientific** or medical **volume data** . Voxel data lends itself towards volume rendering or volume imaging, which allow the user to...

...medicine, for use in tests such as the X-ray CT scan. Developments in computer **graphics** have made possible the merging of **volume** -rendered and geometric- **model** forms into one 3-D visual space.

30/3,K/9 (Item 1 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.

04202354 SUPPLIER NUMBER: 19173814
Industrial production and capacity utilization: historical revision and recent developments. (revisions to Federal Reserve System measurements from 1977 to 1996) (includes related articles)
Corrado, Carol; Gilbert, Charles; Raddock, Richard
Federal Reserve Bulletin, v83, n2, p67(26)
Feb, 1997
ISSN: 0014-9209 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 12939 LINE COUNT: 01074

... held fixed for three years rather than allowed to continue its decline, the most recent **IP estimates** would overstate **growth** by about

1/2 percentage point at an annual rate. Within the index, aside from...

...products, non-energy materials, and total energy can also diverge from one another at times (**chart** 4), and such developments are reflected in the timely producer price figures.
The new formulation...

30/3,K/10 (Item 2 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.

03523195 SUPPLIER NUMBER: 15162864
The rising cost of time of females, the growth of national brands and the supply of retail services. (includes appendices)
Pashigian, B. Peter; Bowen, Brian
Economic Inquiry, v32, n1, p33(33)
Jan, 1994
ISSN: 0095-2583 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 10160 LINE COUNT: 01183

... results from a battery of tests provide support for the theory.
This section presents regression **estimates** of the different **trends** that we displayed in the graphs. Our purpose is to estimate the effects of the...

...and our primary interest is on the effects of relative earnings of women on the **growth** of **trademarks** , on manufacturer and retailer advertising, and on store-service intensity. Appendix III presents the data...

30/3,K/11 (Item 3 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.

02191524 SUPPLIER NUMBER: 09034012
England's "age of invention": the acceleration of patents and patentable invention during the Industrial Revolution.
Sullivan, Richard J.
Explorations in Economic History, v26, n4, p424(29)
Oct, 1989
ISSN: 0014-4983 LANGUAGE: English RECORD TYPE: Citation

CAPTIONS: Cummulative sum of recursive residuals. (graph); Values of likelihood parameters for varyng parameter **model** . (graph); English **patents** with **estimated trend** lines, 1661-1756 and 1757-1851. (**graph**) ; Patents listed in 'Subject Index of Patents for Invention.' (graph); Patents issued for chemical processes...

30/3,K/12 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06412086 SUPPLIER NUMBER: 13510669 (USE FORMAT 7 OR 9 FOR FULL TEXT)
An analysis of revisions to the industrial production index.
Kennedy, James
Applied Economics, v25, n2, p213(7)
Feb, 1993
ISSN: 0003-6846 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT

WORD COUNT: 3680 LINE COUNT: 00303

... was obtained as follows. A series of productivity shocks was generated by regressing manufacturing productivity **growth** (**growth** in the final **estimate** of **IP** minus **growth** in hours) on 12 lags of its own past; the residual from this regression was...

...as the productivity shock. This series of shocks is positively correlated with the revision to **IP** **growth** from the first to the fourth estimate, and explains about 15% of the variance in...

New Age Navigation: Innovative Information Interfaces for Electronic Journals

Gerry McKiernan

ABSTRACT. While it is typical for electronic journals to offer conventional search features similar to those provided by electronic databases, a select number of e-journals have also made available higher-level access options as well. In this article, we review several novel technologies and implementations that creatively exploit the inherent potential of the digital environment to further facilitate use of e-collections. We conclude with speculation on the functionalities of a next-generation e-journal interface that are likely to emerge in the near future.

KEYWORDS. E-journals, interfaces, visualization, navigation

Where is the wisdom we have lost in knowledge?

Where is the knowledge that we lost in information?[1]

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The Serials Librarian, Vol. 45(2) 2003
http://www.haworthpress.com/store/product.asp?sku=J123

10.1300/J123v45n02_06

D-LIB® MAGAZINE

Still Digital After All These Years

D-Lib® Magazine (dlib.org) is "a magazine about digital library issues for researchers, developers, and the intellectually curious" produced by the Corporation for National Research Initiatives (www.cnri.reston.va.us), a not-for-profit organization formed in 1986 to "foster research and development for the National Information Infrastructure." Since July 1995, *D-Lib Magazine* has published articles, discussions, project news, and conference and publication announcements about digital library research. It has no print analogue, nor has one been proposed. "[B]y testing the limits of writing in and for a wholly networked environment," the magazine itself was viewed from the onset as an "experiment in electronic publishing." From its inception, *D-Lib Magazine* was considered to be "a testbed for experiments in electronic publishing and advanced research in digital libraries." Indeed, its original editor, in her first editorial, was "most intrigued" and looked forward to publishing "substantive articles that . . . [took] advantage of the power of hypermedia. . . ."[2]

Semantic Analysis and Visualization

In the spirit of its original intent and philosophy, and in recognition of the need to explore alternatives to current information retrieval methods in digital collections, *D-Lib Magazine* recently published a review article that describes an innovative index to the magazine itself. With the full-text corpus of the magazine as the testbed, its authors document, illustrate, and demonstrate experimental digital technologies that seek to reduce the 'cognitive load' associated with conventional search options and provide users with a better understanding of online document collections.[3]

As observed by these investigators,

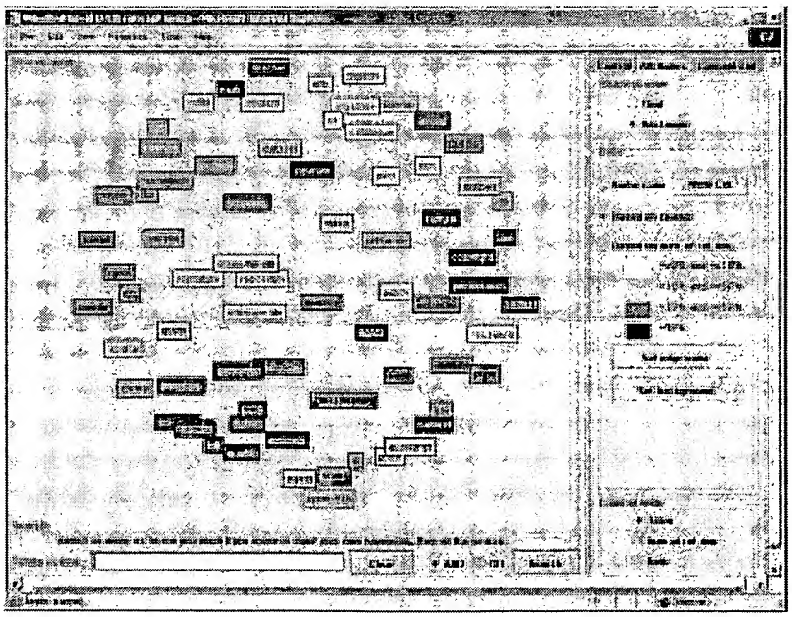
> Numerous IR [information retrieval] techniques have been developed to help deal with the information overload problem. These techniques concentrate on mathematical models an algorithms for retrieval. Popular IR models such as the Boolean model, the vector-space model, the probabilistic model and their variants are well established.
>
> From the user's perspective, however, it is still difficult to use current information retrieval systems.[4]

As an alternative to current conventional information systems, the researchers have developed a method that automatically generates the terms and their semantic relationships representing relevant topics covered in the corpus of a digital collection. The generated terms are called 'concepts,' and the generated terms and their semantic relationships are called the *Concept Space* (ella.slis.indiana.edu/~junzhang/dlib/IV1.html). Concepts are discovered using an algorithm

based on an automated thesaurus generation procedure. The concept space is visualized in a 2-D representation that 'roughly' shows the semantic relationships among concepts (see Figure 1). In the visualization, concept 'nodes' are labeled with the concept name by default. Moving the cursor over a node will display both the concept name and the number of documents within the corpus associated with it. The concept label and number of associated documents can be displayed concurrently by changing the 'label of node' option (see Figure 1, lower right corner). All nodes are initially color-coded based on cluster analysis; strongly related concept nodes are designated by the same color (e.g., blue). In the presentation, similar concepts are generally located close to each other; for example, 'copyright' is near 'permission' (see Figure 1, middle right).

Three tab panels ('Control,' 'Attributes,' and 'Concept List') (see Figure 1, upper right corner) offer users the ability to control and customize the visual-

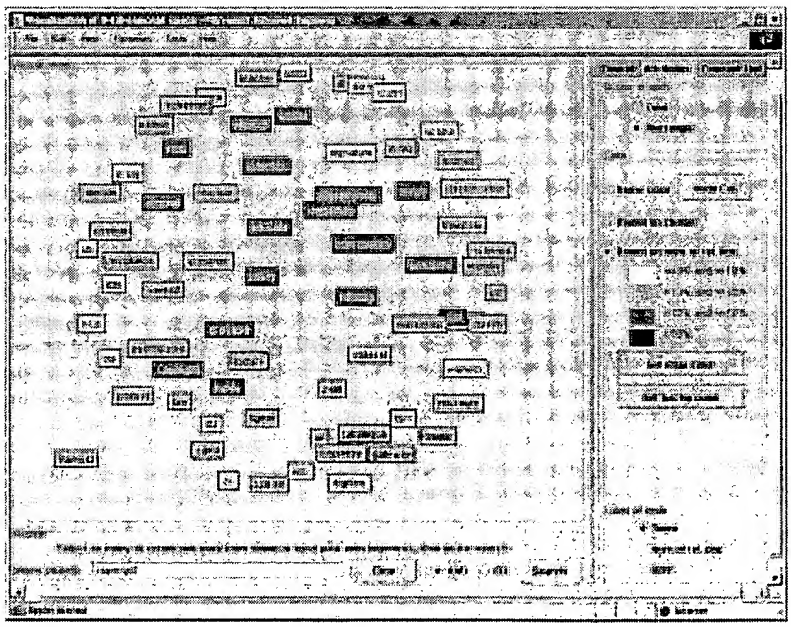
FIGURE 1. The visual display and search interface for *D-Lib® Magazine Concept Space* with a control panel and associated search box. The visualization section with the labeled concept nodes (center) and the control panels (right) occupy most of the screen. A search box is found at the bottom left of the display.



ization, among other options. The attributes panel, for example, allows the user to manipulate different visual attributes of nodes such as their shape, color, and label. An alternative visualization can display the relative percentage of documents associated with a concept in the *D-Lib Magazine* corpus by use of shade coding (see Figure 2). Concepts with fewer than 10% related articles are shown in white, while concepts that appear in more than 30% (but less than 50%) of the articles are shown as gray nodes; concepts that occur in more than 50% of the articles are shown in black. With this visualization, users can quickly determine, for example, that the concepts 'disseminate,' 'interoperability' and 'query' are discussed more frequently than are 'doi,' 'elib,' and 'ncstrl.'

The Concept Space interface allows the user to conduct searches on the collection by selecting labeled concepts directly from the visualization (e.g., 'copyright') or by inputting specific terms or phrases (see Figure 1, bottom left). Users can select as many concepts as desired from the visualization and

FIGURE 2. Users can display the relative percentage of documents associated with concept nodes of the *D-Lib® Magazine* corpus by selecting an alternative label option.



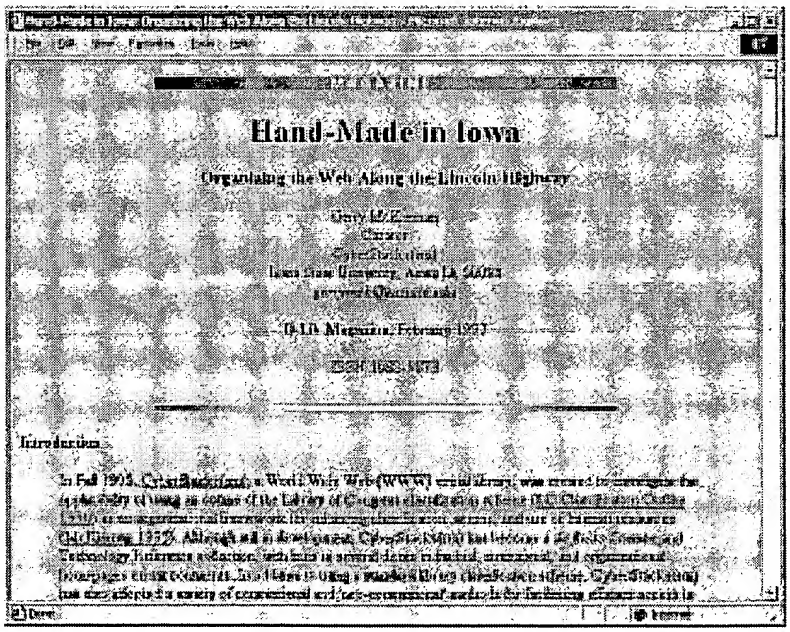
construct appropriate Boolean statements by selecting the appropriate operation ('AND' or 'OR') in the search box panel (see Figure 2, bottom left). Concept label terms can also be combined with keywords within a query. When the search button is clicked, the search results are displayed in a separate browser, and include the article title, author(s), and volume and issue number (if assigned) for each relevant document. By clicking the hyperlinked phrase ('Full text') found as the last field for each entry in the results listing, the associated full-text item is displayed (see Figure 3).[5]

ASTRONOMY AND ASTROPHYSICS SOM INDEX

Centre de Données Astronomiques de Strasbourg

The Centre de Données Astronomiques de Strasbourg (CDS) (cdsweb.u-strasbg.fr) is "an International Service under the Federation of Astronomical

FIGURE 3. The full text of articles and other items can be directly retrieved from the search results listing of a *D-Lib Magazine Concept Space* search.



and Geophysical Data Analysis Services (FAGS)" that "collects, homogenizes, distributes and preserves astronomical information." The main CDS services are *SIMBAD* (simbad.u-strasbg.fr/sim-fid.pl), a reference database for the identification and bibliography of astronomical objects outside the solar system; *VizieR* (vizier.u-strasbg.fr/viz-bin/VizieR), a search portal to astronomical catalogs, published tables, and other information sources; and *Aladin* (aladin.u-strasbg.fr/aladin.gml), "an interactive software sky atlas . . . [that allows] the user to visualize digitized images of any part of the sky."

CDS also maintains and distributes the *Dictionary of Nomenclature of Celestial Objects* (vizier.u-strasbg.fr/cgi-bin/Dic) *AstroWeb: Astronomy on the Web* (cdsweb.u-strasbg.fr/astroweb.html), as well as *StarPages: Astronomy Yellow Pages* on the Web (cdsweb.u-strasbg.fr/~heck/spages.htm). In addition, CDS hosts mirror copies of the *NASA Astrophysics Data System* (ADS) database (adswww.harvard.edu), and provides access to the full-text of select astronomical journals (e.g., *Astrophysical Journal*, *Astronomical Journal*, and *Publications of the Astronomical Society of the Pacific*), and to the article abstracts for Astronomy and Astrophysics, and its Supplement Series.[6]

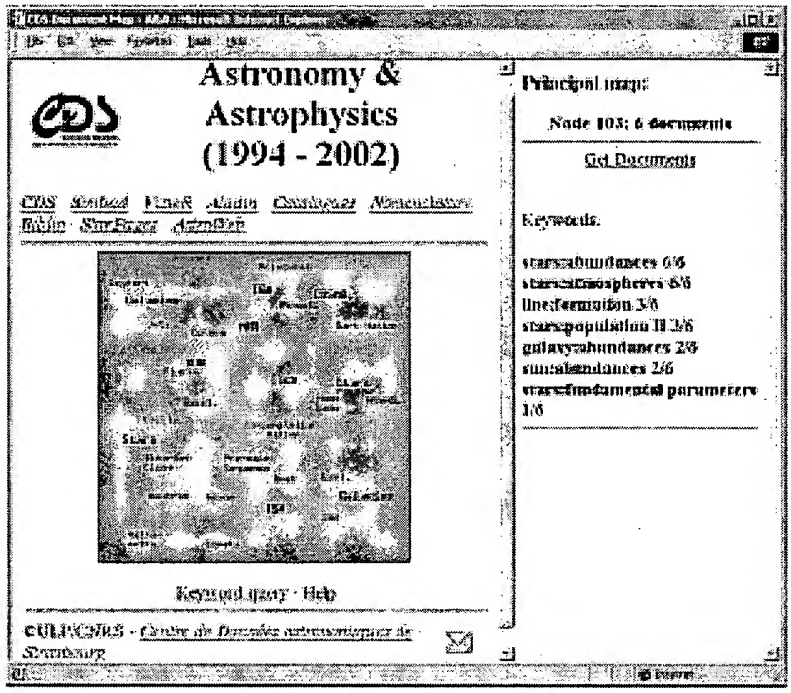
SOM Like It Hot

CDS is also actively involved in the development of bibliographic information retrieval tools, notably visualized indexes to digital collections. A premier example of this tool is the 'document map' developed for *Astronomy and Astrophysics* (simbad.u-strasbg.fr/A+A/map.pl) using the Kohonen Self Organizing Map (SOM) technique. The Kohonen SOM isan algorithm that automatically organizes documents into a two-dimensional grid so that related documents appear close to each other and general topics appear in well-defined areas. The SOM visualization is presented as a density map that graphically represents papers of similar content (see Figure 4, left frame).[7] Presently the SOM map for *Astronomy and Astrophysics* indexes more than 10,300 articles for the period 1994-2002.

To use the interface and retrieve relevant articles, users select an appropriate node (e.g., 'Stars') on the map; in turn, the keywords associated with the node are listed in a right-side frame (see Figure 4). An entry indicating the number of documents containing any of these selected keywords is displayed above the keyword listing in the frame (e.g., 'Principal Maps: Node 103: 6 documents'). Upon retrieving the search results ('Get Documents'), entries for those items assigned the selected keyword are displayed in the left-side frame where the SOM map had originally appeared (see Figure 5).

The full records for all entries may be retrieved by clicking the 'Fetch References' button at the top of the listing in the left-side frame. Upon selection, the full records for will be concatenated in groups of five (5) records (default) in this same frame, replacing the entry listing. Alternatively, the user may display the full record for an entry (e.g., *Abundances of light elements in metal-*

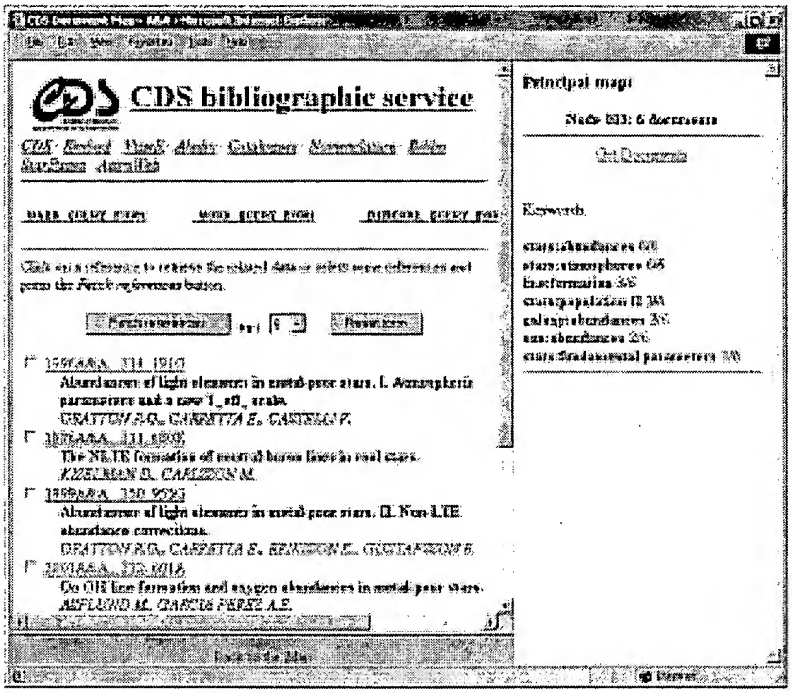
FIGURE 4. Screen print showing the base *Astronomy & Astrophysics* SOM map display (left side). The right frame displays a list of keywords retrieved after selecting the 'Stars' node (Node 103) (middle right) from the SOM map.



poor stars. I. Atmospheric parameters and a new T_eff_ scale) by selecting its associated hyperlinked bibliographic code (e.g., '1996A&A...314..191G').

A full record provides the standard bibliographic data and abstract, assigned keywords, links to an associated 'CDS file,' SIMBAD file, and 'full paper,' if available, as well as the corresponding record within the NASA ADS service. The ADS record offers access to the document full-text in a variety of formats, when available, as well as a separate link to the references in the source documents. In addition, the ADS service provides links to a listing of works that cite the article associated with the displayed record; to other documents in the ADS database with 'Similar Abstracts'; and to 'Also-Read Articles,' the set of articles displayed by users who also displayed the article currently being viewed.[8]

FIGURE 5. Upon retrieving the search results ('Get Documents') (see Figure 4, right frame), relevant entries for a selected keyword are displayed in the left-side frame where the SOM map had originally appeared.



If more than 30 articles are associated with a particular node, the user may request that a detailed SOM map for this cluster be generated ('Construct a local map'). From within a newly displayed local map, the user can then focus on one (or more) of the aspects of this particular grouping. Individuals may also identify and select relevant standardized terms or phrases using a 'keyword query' option. A listing of matching selected terms and phrases are listed in a right-side frame after the query is executed. Upon selecting an appropriate phrase, an associated SOM is created in the left-side frame with identical display or retrieval options as found in the principal SOM.

A Kohonen SOM document map has also been created for *Astrophysical Journal* (simbad.u-strasbg.fr/ApJ/map.pl) and the VizieR catalog service (vizier.u-strasbg.fr/cgi-bin/VizieR).[9, 10]

INSTITUTE OF PHYSICS

Institute of Physics Electronic Journals

The Institute of Physics (IOP) (www.iop.org) is "an international learned society and professional body for the advancement and dissemination of physics, pure and applied, and promotion of physics education." Founded in 1874, IOP is based in London, with offices and branches throughout the world. Today, it has more than 30,000 members worldwide. A wholly owned company, Institute of Physics Publishing (IOPP) is "a leading international publisher of journals, books and magazines in physics and a world leader in electronic publishing."[11]

Currently, IOPP publishes or provides access to more than three-dozen scholarly electronic journals in physics and other scientific disciplines. Available titles presently include:

- *Journal of Physics A: Mathematical and General*
- *Journal of Physics B: Atomic, Molecular and Optical Physics*
- *Journal of Physics: Condensed Matter*
- *Journal of Physics D: Applied Physics*
- *Journal of Physics G: Nuclear and Particle Physics*
- *New Journal of Physics*

as well as, among others,

- *Chinese Physics*
- *Classical and Quantum Gravity*
- *Combustion Theory and Modelling*
- *Journal of High Energy Physics*
- *Journal of Micromechanics and Microengineering*
- *Journal of Turbulence*
- *Measurement Science and Technology*
- *Modelling and Simulation in Materials Science and Engineering*
- *Nanotechnology*
- *Network: Computation in Neural Systems*
- *Physics in Medicine and Biology*
- *Plasma Physics and Controlled Fusion*
- *Semiconductor Science and Technology*
- *Smart Materials and Structures*
- *Superconductor Science and Technology*[12]

Searching, Searching, Searching

The IOP e-journal collection can be searched in combination or individually by title, abstract, author, or affiliation, or by exact phrase. All journals can be searched concurrently (default), or the user can select one or more specific journals from an alphabetized list. Alternatively, users can select and search a

journal from a categorized list (e.g., 'Condensed Matter and Materials Science,' 'Applied Physics,' or 'Computer Science'), or choose to search one of two IOPP 'EJs Collections,' *IOP Physics Reviews* or *BEC Matters*. The former collection "brings together review articles published in IOP's journals including topical reviews and reviews from the Institute's dedicated review journal–*Reports on Progress in Physics*,"[13] while the latter is "a special service for the Bose-Einstein condensation and matter wave community."[14]

Individuals may choose to search all available years (Jan. 1946 to present), or a particular annual period (e.g., 'Jan. 2000' to 'Dec. 2002'), by selecting the desired month-year from a drop-down menu. Currently, IOP is actively engaged in a project to digitize its entire journal archive retrospectively to 1874.[15]

Vivísimo

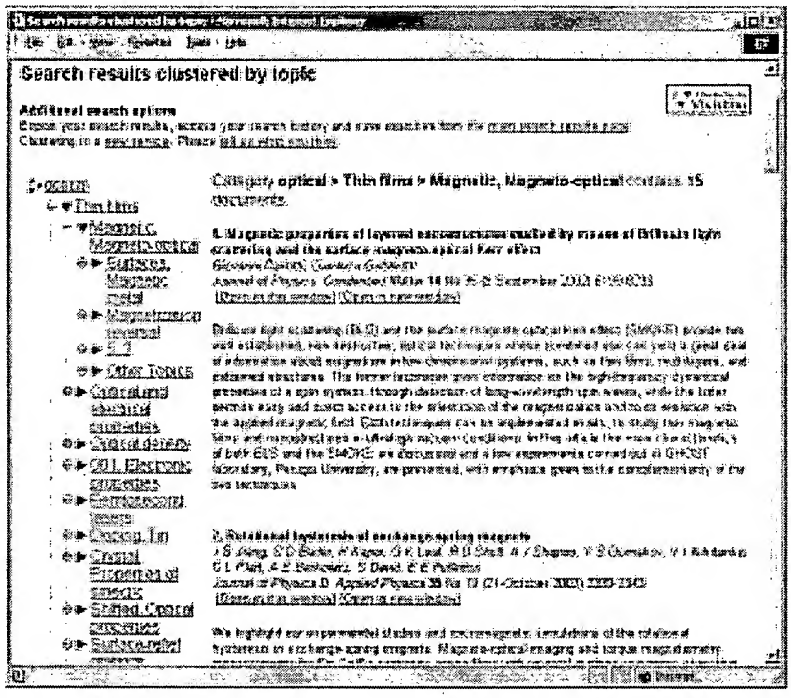
Results from a journal search may be displayed in a 'summary format' or an 'abstract format.' The former provides a citation format for list of relevant records, with links to the abstract, references, and the full text in PDF or HTML format, while the latter includes the elements found in the summary format and an associated abstract. As a default, entries for either format are displayed by date in reverse chronological order ('natural') (most recent first), in groups of ten records. Users may initially display, or subsequently redisplay records, in groups of 25, 50, or 100 records and/or sort (or resort) records by author, affiliation, or relevance. Records can also be sorted in strict chronological order ('reverse') (most recent last).

Alternatively, users may initially (or subsequently) *cluster* search results by the topics and subtopics found within the titles and abstracts of a retrieved set. Clustering is a technique that groups documents based on similarity. Within the IOP e-journal collection, clustering is available for searches that generate more than 25 records, and currently a maximum of 250 records can be clustered. The results that are clustered will depend on the sort options selected for the initial search (i.e., 'Date,' 'Author,' 'Affiliation,' or 'Relevance').[16]

Clustered results are grouped by appropriate topic (e.g., 'thin films,' optical fibre,' 'nonlinear optical,' etc.) and by "the overall rank of the individual search results in the search engine's output." The user can narrow a search within a cluster, by expanding the cluster and selecting a subcluster. Those records with which a cluster or subcluster is associated will be displayed to the right of the cluster tree (see Figure 6).

To generate its clusters, IOP has selected Vivísimo Clustering Engine™ (vivisimo.com), a technology that "uses sophisticated algorithms to cluster articles into meaningful topic categories, based on the words appearing in the abstract and title"; in this application, the full-text of an article is not processed. The Vivísimo engine does not employ a pre-defined taxonomy or controlled vocabulary; as a result the topic names for clusters and subtopics are generated directly from the search results.[17]

FIGURE 6. In the cluster display option in the Institute of Physics (IOP) electronic journal collection, the user can 'narrow' a search within a cluster, by expanding the cluster and selecting a subcluster. Those records with which a subcluster (or cluster) is associated will be displayed to the right of the cluster tree.



Vivísimo was founded in June 2000 by research computer scientists affiliated with the Computer Science Department at Carnegie Mellon University, Pittsburgh, Pennsylvania, where related research was originally conducted with support from the National Science Foundation.[18]

HIGHWIRE PRESS®

"In the Beginning . . ."

HighWire Press® (highwire.stanford.edu) is "an enterprise unit of Stanford University Libraries and Academic Information Resources . . . [that is commit-

ted to] charting new waters as [a co-publisher] of low-cost, graphically rich Internet editions of university and scholarly society e-journals. [It] works with [scholarly societies and responsible publishers] to publish, distribute, and archive e-journals, . . . providing a common user interface to its titles and hyperlinks to . . . [relevant] Web sources. The [overall] goal of HighWire Press is to 'return responsibility for scholarly publishing to those committed to the primacy of scholarly communication rather than profit taking.' "[19]

Its first online journal was the *Journal of Biological Chemistry (JBC)*, which was made available in late May 1995. *JBC* was followed by *Science*, the journal of the American Association for the Advancement of Science (AAAS), and subsequently by the *Proceedings of the National Academy of Sciences of the United States of America*.[20] Today, HighWire Press hosts more than 340 electronic journals in the biological, medical, and physical sciences, as well journals in select fields of the social sciences.[21, 22] More than a dozen additional titles are scheduled to become available in 2003.[23]

The growing list of HighWire Press collaborating publishers, and their select publications, includes:

- American Medical Association
  - *Archives of Family Medicine*
  - *Archives of Internal Medicine*
  - *JAMA–The Journal of the American Medical Association*
- American Society for Microbiology
  - *Applied and Environmental Microbiology*
  - *Journal of Bacteriology*
  - *Molecular and Cellular Biology*
- British Medical Journal (BMJ) Publishing Group
  - *Gut*
  - *Heart*
  - *Thorax*
- Company of Biologists
  - *Development*
  - *Journal of Cell Science*
  - *Journal of Experimental Biology*
- Endocrine Society
  - *Endocrine Reviews*
  - *Endocrinology*
  - *Journal of Clinical Endocrinology & Metabolism*
- Lippincott, Williams & Wilkins
  - *Circulation*
  - *Hypertension*
  - *Stroke*

- Oxford University Press
  - *Annals of Botany*
  - *The EMBO Journal*
  - *Journal of Heredity*[24]

HighWire Press also currently provides "the largest archive of free life science articles in the world," offering access to nearly 440,000 full-text articles without charge, adding nearly 3,000 items each month.[25]

Eclectic Journals

HighWire Press was founded to ensure that its publishing partners lead the transition to the use of new technologies for scientific communication. As a major innovator in scholarly publishing, HighWire Press does not, however, simply "mount electronic images of printed pages; rather, by adding links among authors, articles and citations, . . . [and offering] advanced searching capabilities, high-resolution images and multimedia, and interactivity," its "electronic versions provide added dimensions to the information provided in the printed journals."[26]

Indeed, as stated in its original prospectus in June 1995, one of the key missions of the proposed "Networked Publishing project dubbed "The HighWire Press'" was to "use innovative network tools for capture, publishing, retrieval, reading, and presentation."[27]

Browse Articles by Topic

To assist users in identifying potentially relevant articles on a particular subject, HighWire Press has organized all e-journal titles by broad (e.g., 'Biological Sciences,' 'Medical Sciences,' 'Physical Sciences,' and 'Social Sciences') and general topics (e.g., 'Biological Sciences': 'Agriculture,' 'Biochemistry,' 'Cell Biology,' etc.). In selecting a specific general topic (e.g., 'Cell Biology'), the associated general subtopics are subsequently displayed (e.g., 'Cell Physiology,' 'Cellular Structures,' 'Cellular Types,' 'Systems Biology') with an indication of the number of associated articles for each (e.g., 'Cell Physiology (515,871)'). In addition, a ranked listing of journals that publish on a general topic is also provided.

From within a general topic, users can subsequently display articles that are categorized under specific subtopics (e.g., 'Cell Physiology,' 'Cellular Structures,' 'Cellular Types,' 'Systems Biology') by selecting a hyperlinked subtopic of interest. Within HighWire, articles are also categorized to a very high degree of specificity (e.g., 'Cell Biology > Cellular Structures > Mitogens > Mitogenic Pathway') (see Figure 7). In selecting a specific subtopic, a list of records for relevant articles (or Medline abstracts) is displayed in relevancy order. Among various options, users can select items from the listing and display these with

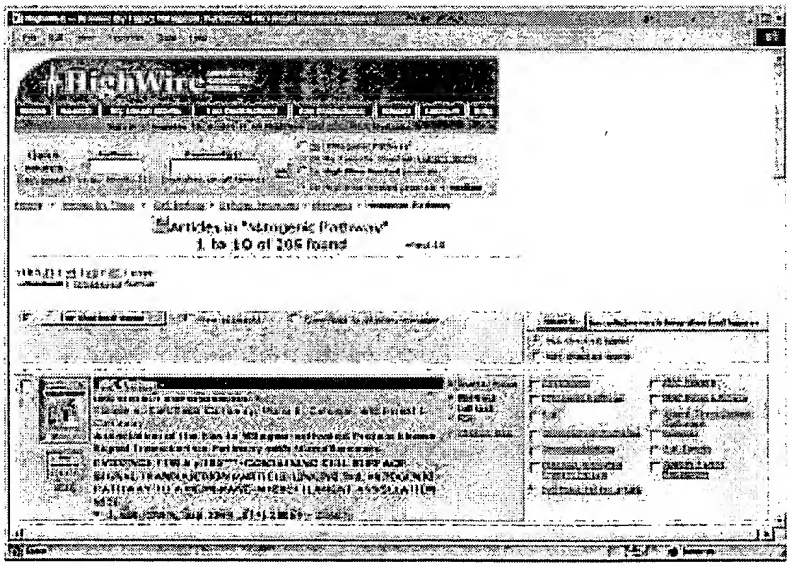
abstracts, or choose to export records for use in bibliographic software packages ('Download to citation manager'). For subscribed and free journals, readers can display the full-text for an entry in PDF or HTML format, where available (see Figure 7).

The topics and subtopics for HighWire Press articles have been assigned using the Semio automated categorization software technology provided by Entrieva (www.entrieva.com), a "leading provider of information categorization solutions."[28]

TopicMap

Within HighWire Press, users may also browse specific topics or subtopics by using a *TopicMap*, a special Java applet designed to display standardized topics and subtopics in a graphical form that provides a "sense of context"

FIGURE 7. Within HighWire, articles are also categorized to a very high degree of specificity (e.g., 'Cell Biology > Cellular Structures > Mitogens > Mitogenic Pathway').



while navigating a large, tree-structured database. As of December 31, 2002, there were more than 30,400 established topics and subtopics (see Figure 8).

TopicMap is based on the Star Tree SDK for Java, licensed from Inxight Software, Inc. (www.inxight.com).[29] Inxight was established in 1996 by Xerox Corporation as part of the Xerox New Enterprises initiative "... to capitalize on breakthrough user interface, linguistic and information access technologies invented and developed at the Xerox Palo Alto Research Center (PARC) and the Xerox Research Center Europe."[30]

When TopicMap is launched, it appears in a separate window. A left click of a topic node (e.g., 'Cell Biology') will reposition it to the center of the TopicMap display (see Figure 9); a left click-and-drag allows the user to change the specific location of a node and its associated subtopics.[31] A double left-click on a topic node will display the associated categories or records in the original window.[32]

FIGURE 8. Users can also browse general topics and lower level subtopics using *TopicMap*, a special graphical Java applet.

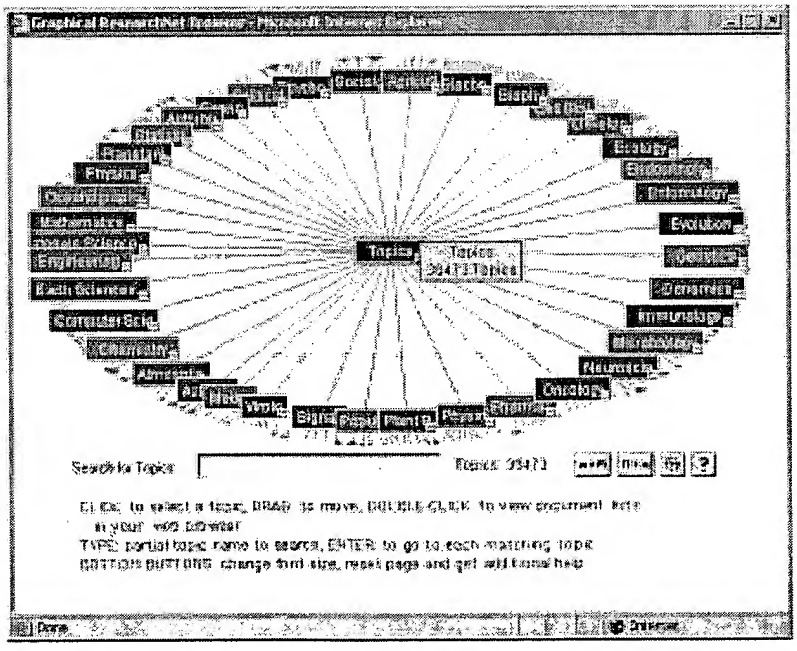
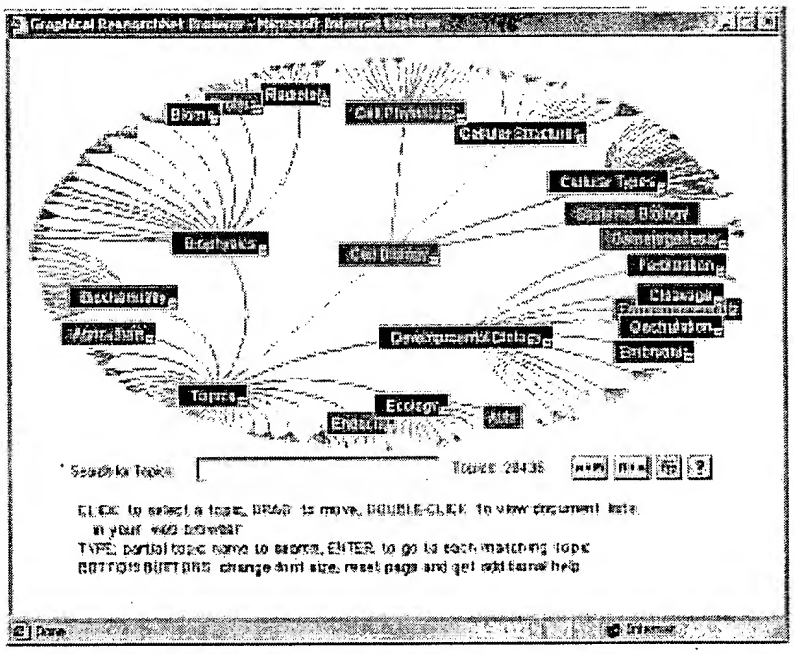


FIGURE 9. A left click of a *TopicMap* node (e.g., 'Cell Biology') will reposition the topic to the center of the *TopicMap* display.



The TopicMap can also be searched and subsequently browsed for the occurrence of broad or narrow topics by entering a candidate term or phrase (e.g., 'Cell Biology'), subtopic (e.g., 'Cellular Structures'), or a subtopic at lower levels in the topic hierarchy (e.g., Mitogens; Mitogenic Pathway), in a search box ('Search for Topics') located beneath the hyperbolic tree display (see Figures 8 and 9).

Citation Map

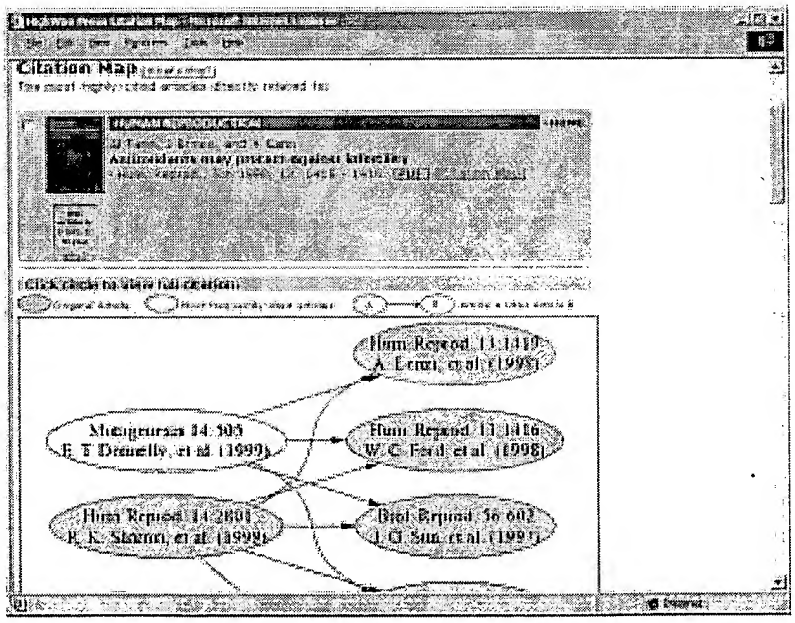
In select cases, search results entries will include other or alternative display options (e.g., 'Abstract,' 'Free Summary,' 'extra: Supplemental Data,' and 'Citation Map') among others. The latter display option, a *Citation Map*, is "a graphical representation of the articles citing or cited by . . . [a] selected arti-

cle" (see Figure 10) and is "based on the references found in the full text articles of the HighWire-hosted journals."[33]

> [G]iven a starting reference, Citation Map finds all articles related by citations either citing the article, or cited by the article. The result set is expanded outward from the starting article to make a collection of all the articles related by citation to the starting article. By noting the number of times each article in the collection is cited, the related papers with the greatest impact are graphed, along with the citing/cited-by relations among the articles in the collection. This shows . . . the most important papers related to a starting article, as well as temporal and 'line-of-cite' relationships between these articles.[34]

A listing of the cited articles (and citing articles, where available) from the Citation Map will be displayed beneath the map, in order by the most frequently cited, with the identical display configuration and retrieval options previously noted for search and/or browse results.

FIGURE 10. The *Citation Map* is a graphical representation that depicts "the most important papers related to a starting article, as well as temporal and 'line-of-cite' relationships between these articles."



Topic-Search from Individual Search Results

In a recently introduced enhancement, individual records retrieved from a search display the subtopics assigned to an article. For any or all records, a user can select any subtopic ('ANY checked topics') or all subtopics ('ALL checked topics'), and subsequently execute a search ('Search for articles matching checked topics') (see Figure 11, right side).

Clustering

To facilitate the identification of the *specific* subject content of search results, HighWire Press also recently introduced a functionality that permits users to manipulate an 'Instant Index' of the search results (see Figure 12, top half). After an initial results display, the user can display a ranked list of subject content for the retrieved search results subset. From this categorized list,

FIGURE 11. A recently introduced HighWire Press enhancement enables a user to select any or all subtopics to an article from within retrieved results, and then execute a new search on the selected subtopics.

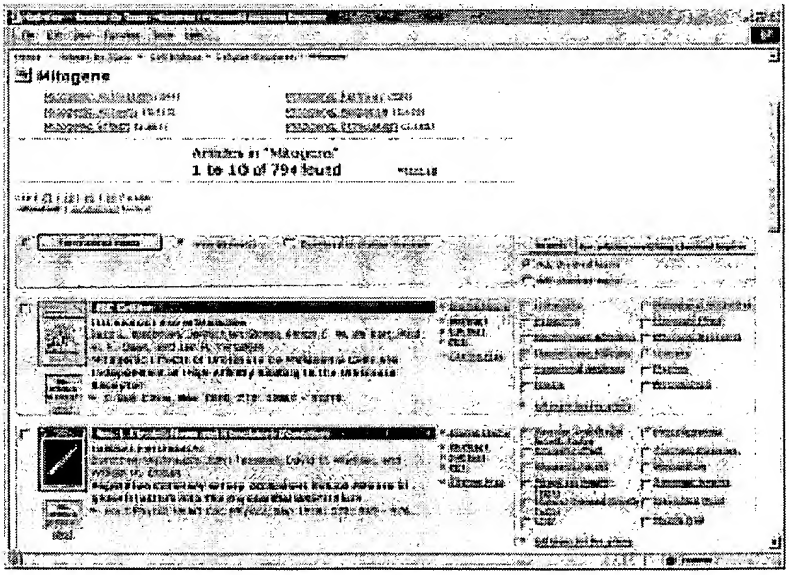
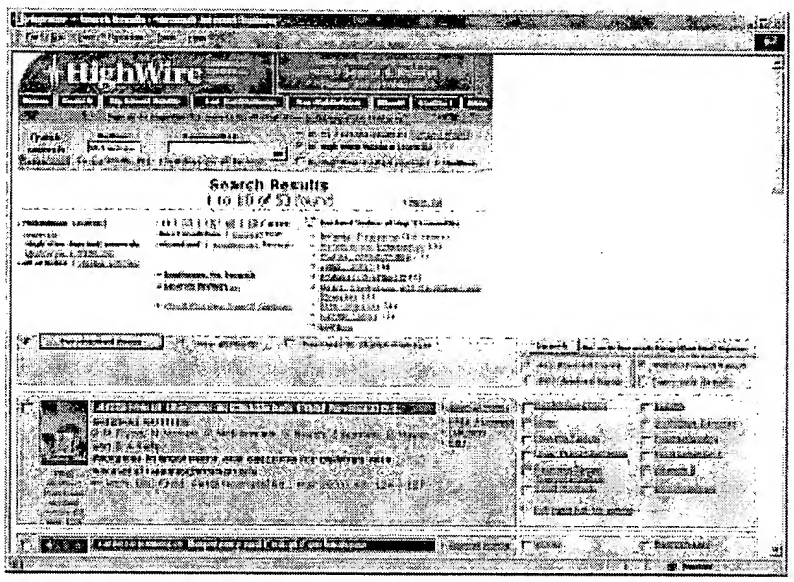


FIGURE 12. A recently introduced HighWire Press functionality provides an 'Instant Index' of the *specific* subject content of search results.

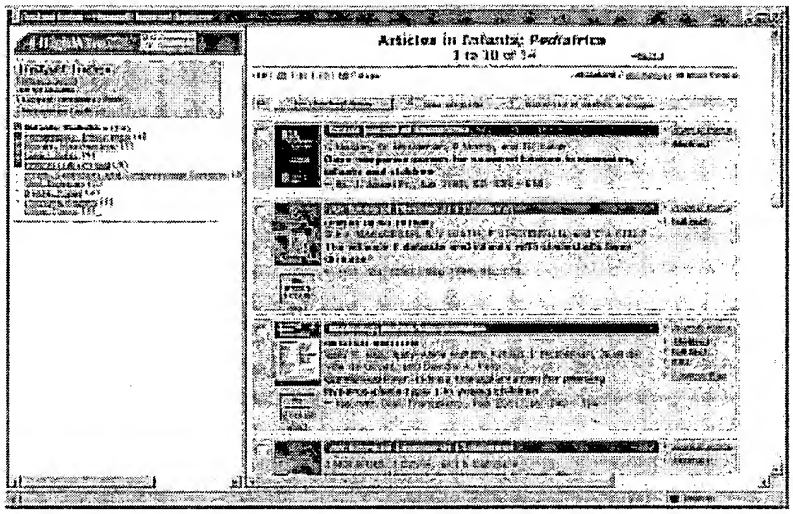


the user can display those records associated with the specific subject content (e.g., 'Infants; Pediatrics') (see Figure 13) and subsequently retrieve the full-text, where available, for items of interest. Clustering is available for searches with a minimum of 50 results, and will be applied to a maximum of the first 500 records.[35] Content categorization is a specific implementation of Vivísimo (vivisimo.com), the document clustering technology also utilized by the Institute of Physics Publishing (IOP) for its e-journal search results (q.v.).

Keyword-in-Context (KWIC)

To assist users in evaluating the potential relevancy of results of an Internet search engine query, it has become common practice for many services to only not highlight the search terms (or phrases) in a results list, but to include the textual context(s) of the term or phrase with the results entry as well. Recog-

FIGURE 13. From the 'Instant Index,' the user can select from a ranked listing (left side) and subsequently display associated records (right side).



nizing the inherent benefit that context offers in the information seeking process, HighWire Press recently incorporated a keyword-in-context feature.

In addition to TopicMap, Citation Map, clustering, and other current and recently introduced features, HighWire Press plans to make available several additional innovative search, browse, and display functionalities.

Browse Journals by Topic and Link to Articles from Ranked Journals

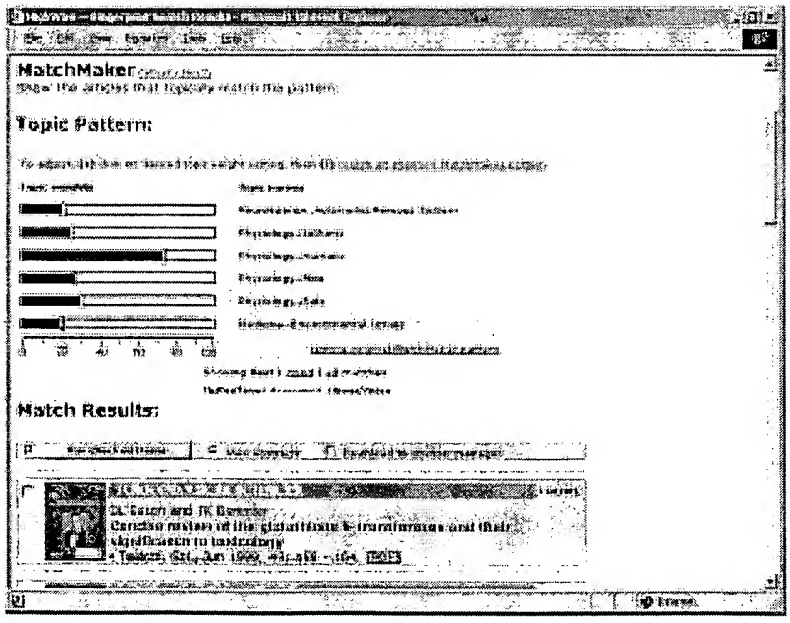
As previously noted, HighWire Press users can currently browse articles using a linear topic hierarchy (e.g., 'Cell Biology > Cellular Structures > Mitogens > Mitogenic Pathway'). In a forthcoming enhancement, readers also will be able to browse *journal titles* by subtopic within a topic hierarchy using the identical linear topical pathways available for articles. By default, journal titles in such displays are listed in descending order by 'focus.' In this context, 'focus' is defined as the "emphasis or proportion by the intensity of a journal on the topic relative to other journals. . . . " Alternatively, users may display a listing of journals for a specific topic or subtopic by number of articles that a journal has published on a selected subject ('frequency'), or in alphabetical or-

der by journal title. From any of these displays, users are able to browse articles within a journal by a topic (or subtopic) by selecting a hyperlinked option ('Browse articles on this topic').

MatchMaker

To further facilitate the identification of articles on a subject, HighWire Press will soon offer a *MatchMaker* service for author or keyword searches, providing a matching set of articles based on a weighted set of subtopics. From a starting citation or result set, MatchMaker extracts a pattern of relevant subtopics and displays these as a series of horizontal bar charts in a 'MatchMaker Topic Pattern' (see Figure 14). If desired, the user can reduce the relative weight on a subtopic by clicking on one or more of the bars, or increase the weight by clicking on the space to the right of a bar. A search can then be executed using the modified pattern ('match on changed MatchMaker pattern'). Articles that best match an original or revised pattern are listed in relevancy order.

FIGURE 14. In a 'MatchMaker Topic Pattern,' the relative weight of subtopics is displayed as a series of horizontal bars.



LONDON BUSINESS SCHOOL LIBRARY

London Business School

Founded in 1965, the London Business School (LSB) (www.london.edu) is "one of the pre-eminent international business schools . . . consistently ranked in the top ten of world business schools." It employs more than 90 world-renowned faculty and enrolls more than 1,000 graduate students and 4,500 executive education participants each year. Its library offers users a wide range of specialized as well as general print and electronic resources, including more than 20,000 books, 60 electronic databases, 1,000 serial titles, international and historic annual reports, market research reports, and more than 8,000 working papers from 32 institutions.[36]

In addition to a Web-based online catalog, the London Business School library provides access to a number of major electronic resources, most notably:

- Butterworths *Accountancy Direct* (online accounting reference resource);
- *EconLit* (economics and finance bibliographic database);
- *Factiva* (multilingual content covering nearly 8,000 sources, including Dow Jones and Reuters Newswires and *The Wall Street Journal*);
- *IDEAL Online Library* (electronic journals from Academic Press and other publishers);
- *Hoover's Online* (company, industry, and market intelligence database);
- *Investext Plus* (investment research reports);
- *JSTOR* (science, social science, and arts and humanities electronic journals);
- *ProQuestDirect* (abstract and index database of business and management journals, with full-text);
- *PsycARTICLES* (full-text of American Psychological Association journals); and
- *ScoRe* (a national catalogue of company reports in British libraries).

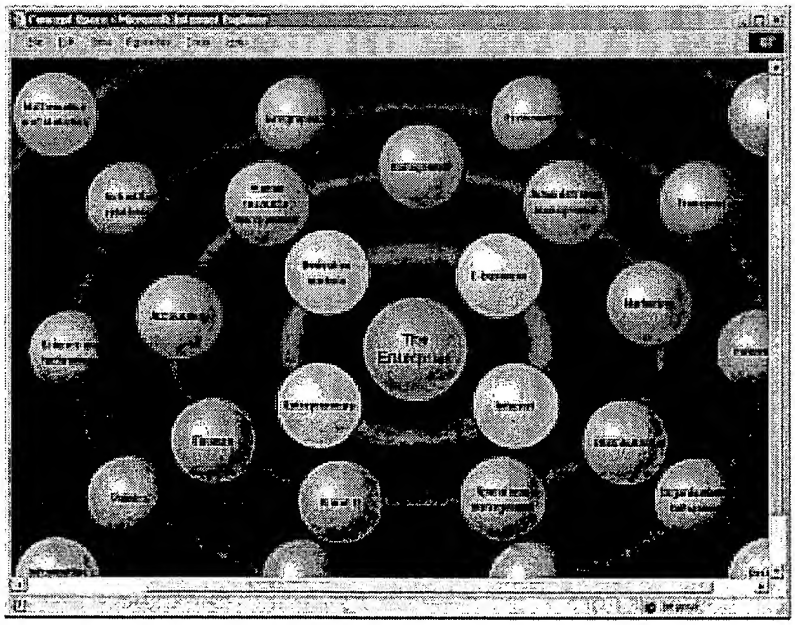
Material in the London Business School library is organized according to the *London Classification of Business Studies* (LCBS), a specialized classification scheme and thesaurus for the business literature and resources used by a number of British and international business schools, corporate libraries and information centers. Aslib published the second edition of LCBS in 1979. Subsequently the classification and thesaurus has been updated and amended by the London Business School, with the most recent version published in July 2001. A Web version of the classification and thesaurus is available as *Concept Space*, a graphical representation with associated links to organized collections of global and institutional electronic resources.[37]

Concept Space

Concept Space (conceptspace.london.edu) is a visual search tool for business concepts linked to a variety of select information resources made available to LSB-affiliated staff and students. Within Concept Space, users can explore relationships between business terms, phrases, and concepts (see Figure 15), and directly link to a range of sources. While a text version is also available, the graphic version of Concept Space is "dynamic" and "is best for displaying the relationships between concepts."

After selecting a major concept (e.g., 'Operations management') from the initial graphics screen, the user can subsequently explore "the relationship of the selected term to other terms in the same subject area." The nature of these relationships is depicted by the color and distance of a colored sphere from the central concept. The term and/or phrases relationships are coded as follows (see Figure 15):

FIGURE 15. Within *Concept Space*, users can explore relationships between business terms, phrases, and concepts using a graphical interface.



- Main term (e.g., 'The Enterprise') in Red
  By clicking on a selected major term, additional details about the term can be displayed. These include notes on the use of the term, its synonyms, and its class mark in the London Business School Library;
- Broader terms (e.g., 'Mathematics and Statistics') in Green
  Terms shown in the color green are more general terms in the subject hierarchy. One can view the wider context of a term by clicking on it;
- Narrower terms (e.g., 'Industrial relations') in Blue
  Terms shown in blue are more specific terms or sub-categories in the subject hierarchy;
- Related terms (e.g., 'Operations management') in Purple
  Terms shown in purple are other subject terms of potential interest
- Highlighted terms (e.g., 'Entrepreneurs') in Yellow

In selecting a term or phrase for focus (e.g., 'Operations management'), the user is presented with a new window (see Figure 16) in which a series of related concepts are presented. From within this screen the user may select a narrower term (e.g., 'Production methods') and browse its associated concepts, or execute a search within one or more groups of electronic LSB library resources for the initial concept. By clicking the 'Search related sites' hotlink (or its associated globe-like icon) located within the left-side frame of the screen (see Figure 16), the user is presented with categories of relevant information resources (i.e., 'Business books,' 'Business articles,' 'Academic,' 'Companies and competitors,' 'Find out more') (see Figure 17). In selecting a specific resource (e.g., 'NBER Working Papers' from the 'Academic' category), the source is searched using the term or phrase associated with the particular selected concept (e.g., 'Production methods') (see Figure 18).

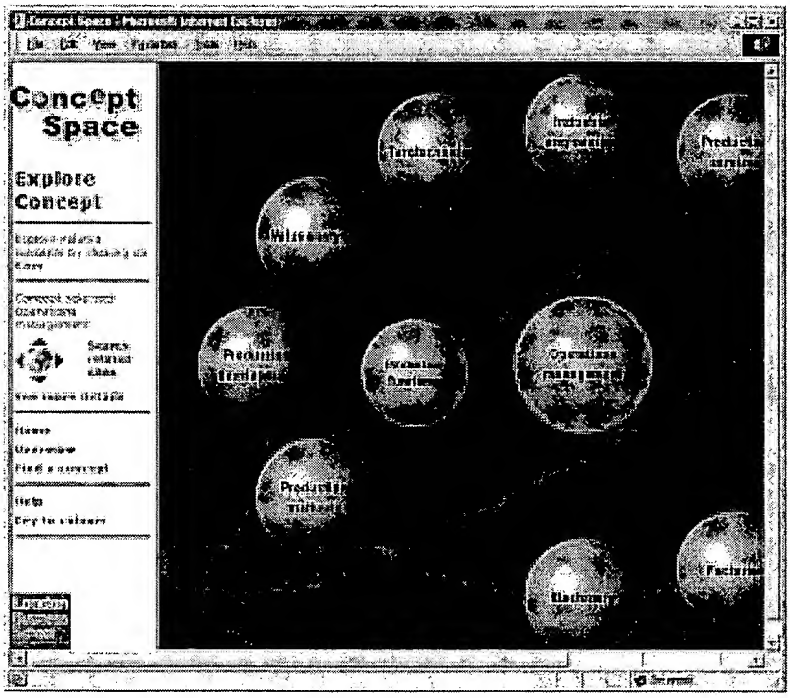
Concept Space is an interface to a subset of electronic resources from the London School of Business. In addition, due to licensing requirements, access to certain resources may be limited to staff and students. Concept Space was developed for London Business School Library by TLA Ltd. (www.tlaweb.net, a Web technology and content developer).

UTRECHT UNIVERSITY LIBRARY

Utrecht University

Established in 1636, Utrecht University is one of the oldest universities in Europe, recently commemorating the 365th anniversary of its founding. It currently offers the widest range of courses of any university in the Netherlands, with more than 14 faculties and 70 degree courses.[38] Current faculties include Arts, Biology, Geographic Sciences, Mathematics and Computer Science, Philosophy, and the Social Sciences. In addition, there are the faculties of

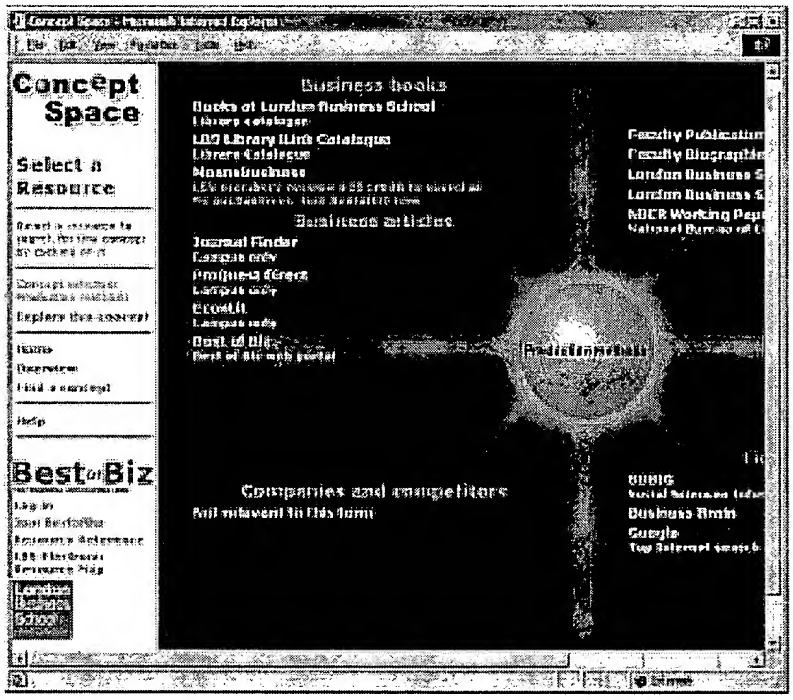
FIGURE 16. In selecting a term or phrase for focus in *Concept Space* (e.g., 'Operations Management'), the user is presented with a new window in which a series of related concepts are presented. From within this screen, the user may select a narrower term and browse its associated concepts, or execute a search within one or more groups of electronic London School of Business library resources for the initial concept ('Search related sites').



Medicine, Pharmaceutical Sciences, and Veterinary Medicine.[39] In 2001, it had an enrollment of more than 22,400 students, with more than 3,100 enrolled in the Faculty of Medicine alone, and nearly 5,000 enrolled in the Sciences.[40]

In addition to its print collection, the Utrecht University Library offers its faculty, staff, and students access to a wide variety of electronic information sources that include bibliographic and abstract databases (e.g., *Medline*, *Nursing and Allied Health*, *PsycINFO*), select Internet sites, full-text doctoral dissertations, and e-journals.[41]

FIGURE 17. After clicking the 'Search related sites' hotlink (or its associated globe-like icon) located within the left-side frame of the screen (see Figure 16), the user is presented with categorized lists of information targets from which a search on a selected concept can be executed (right frame).

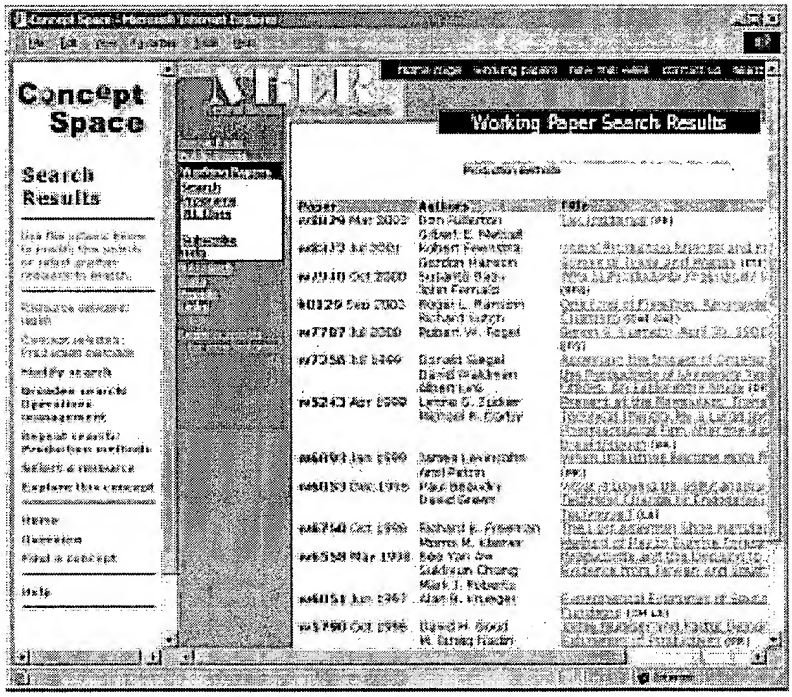


To demonstrate enhanced access to select electronic resources offered by Utecht University, MediaLab (www.medialab.nl), a Dutch firm specializing in 'knowledge mining' and creation of 'intelligent' Intranet and Internet sites,[42] has applied its *AquaBrowser* technology to select electronic medical information resources made available by the university library.

AquaBrowser

The AquaBrowser is "a software tool that presents large amounts of information from different sources in a playful and exciting manner." The AquaBrowser

FIGURE 18. After selecting a specific target, the source is automatically searched using the term or phrase associated with the particular selected concept, and the results subsequently displayed in the right-side frame.



enriches a query (e.g., 'pancake') by linking to related terms (e.g., 'crepe,' 'pizza,' 'pita'), by providing context (e.g., 'breakfast,' 'birthday,' 'syrup') and offering direct relations (e.g., 'flour,' 'butter,' 'batter') that may lead to "surprising discoveries" (e.g., 'caviar').[43]

There are several components to the AquaBrowser system, including various tools that gather, analyze, and create linkages from a range of electronic sources (e.g., databases, Web sites, CD-ROMs, etc.). 'Liquid Filters' extracts information from various sources and transfers it to the 'Liquid Knowledge Builder.' The source material itself is cached in the 'IGOR' database (see below). The knowledge builder analyses all the information extracted by the filters. An integrated dictionary is utilized in the analysis, which can be enhanced

by the incorporation of a subject thesaurus. Subsequently, mathematical models are created based in part on the frequency and clustering of terms.[44]

IGOR is the AquaBrowser's 'black box.' Among its components and functionalities are:

- a freetext search engine (a searchable index of all the words in a corpus);
- rankers (rankers provide 'fuzzy' answers to specific questions);
- a co-occurrence generator (this generator analyses texts from source databases and creates statistical and semantic relations between constituent terms and phrases);
- a translation unit (the translation component provides automatic translations of queries and keywords into 'other languages, specific jargon, archaic dialects, or technical phrases');
- a fuzzy alternative generator (this generator creates correct and incorrect variations of terms and phrases);
- stemmers (stemmers isolate the semantic stem of a term facilitating a search for synonyms and variants).[45]

The 'Liquid Context Builder' is the system's 'top layer' that "enriches the user's queries and keep track of all the steps in the search [process]." In addition, the context builder produces the list of results and the 'cloud of associations' that lead "the way to more relevant information along different routes." Upon execution of a search, the 'cloud of associations' (see Figure 19, right side) and portions of the records (see Figure 19, left side), are displayed in the AquaBrowser.[46]

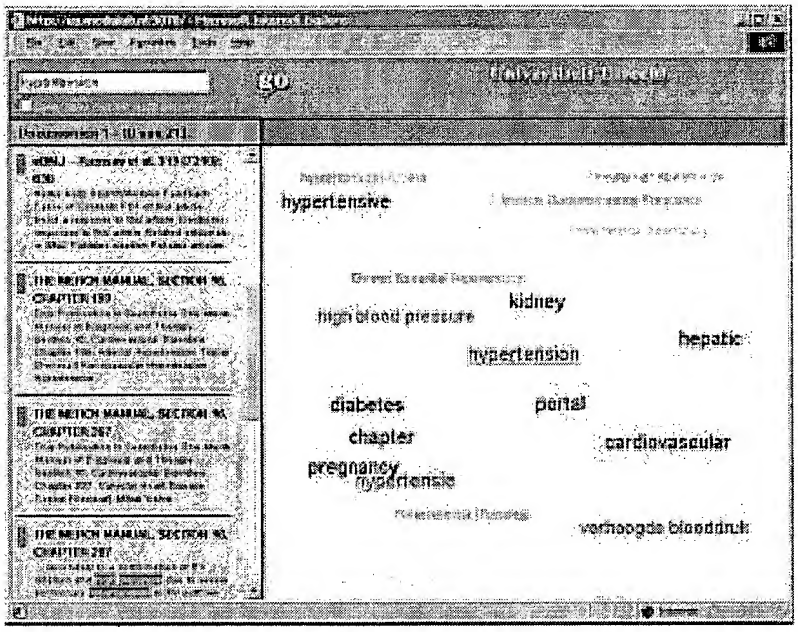
The AquaBrowser interface offers a "graphical depiction of search results and associations' " that allow the user to search, browse, and "follow the 'cloud of associations'" generated initially from target sources or from a specific query (e.g., 'hypertension')[47] (see Figure 19). The 'cloud of associations' contains associations as well as synonyms, translations, spelling variations, and typographical errors. Upon selecting an entry from results listing displayed in a left-side frame, the associated document is displayed in a right-hand frame (see Figure 20).

Among its many other applications, AquaBrower has been applied as an interface to online public catalogs, namely that of the Netherlands Association of Public Libraries (NBLC) (zoeken.bibliotheek.nl/index.html) and in the eLibraryHub (aqua.elibraryhub.com) of the National Library Board (NLSB) of Singapore.[48]

CONCEPTUAL ACCESS

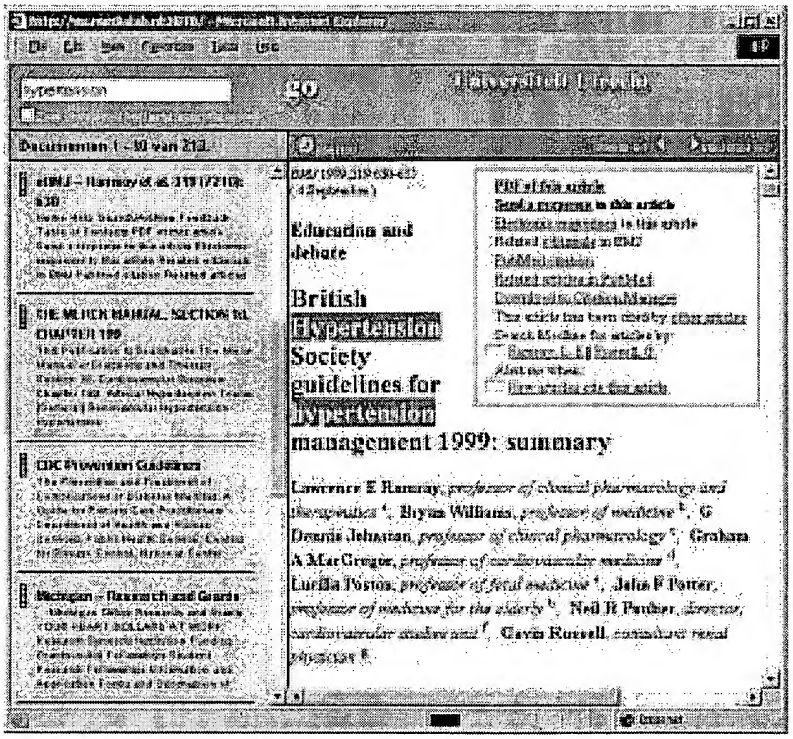
In an effort to enhance access and use of their respective collections, a select number of e-journals have begun to offer novel search, retrieval, and display alternatives that employ emerging and experimental information technologies. In some collections, users are able to browse detailed linear hierarchies (e.g.,

FIGURE 19. The *AquaBrowser* interface offers a "graphical depiction of search results and associations" that allow the user to search, browse, and "follow the 'cloud of associations' generated initially from target sources or from a specific query (e.g., 'hypertension')."



HighWire Press) or expand folders in which content has been automatically categorized (e.g., Institute of Physics Electronic Journals). In others, they can dynamically interact with two-dimensional visualizations of content to explore topics and their associated articles, or other information resources (e.g., *Astronomy and Astrophysics* SOM Index, AquaBrowser, Concept Space, *D-Lib Magazine* index, HighWire Press). Each of these broad approaches not only provides enhanced *subject* access to their respective collections, but more importantly, offer higher levels of access that are paradoxically advanced, yet intuitive. Such *conceptual* access enables users to perform not only standard subject searching and browsing, but more significantly, allows them to dynamically navigate the semantic space of related or associated terms and phrases for a given subject, a feature and functionality unavailable in print journals, and uncommon in most digital collections.

FIGURE 20. In *AquaBrowser*, upon selecting an item from the search results displayed in a left-side frame (e.g., 'eBMJ–Ramsay et al. 319 (7210):630'), the associated full text document is displayed in a right-hand frame.



"A PICTURE IS WORTH A THOUSAND WORDS"

Visual Interfaces

The first International Workshop on "Visual Interfaces to Digital Libraries" was held on June 28, 2001, in Roanoke, Virginia, at the inaugural ACM/IEEE Joint Conference on Digital Libraries. This one-day workshop attracted an international audience of 37 researchers, practitioners, and graduate students with interests in information visualization, digital libraries, human-computer interaction, library and information science, computer science, and geography.

The primary aim of the workshop was to raise awareness of several interconnected fields of research related to the design and use of visual interfaces for digital libraries.[49]As noted in a workshop report, good visualizations can:

- reduce visual research time;
- provide a better understanding of complex data sets;
- reveal otherwise unnoticed relationships;
- offer multiple perspectives on datasets; and
- convey information effectively.[50]

Information Visualization

Information visualization may be defined as "the use of computer-supported interactive visual representation of abstract data to amplify cognition. Its purpose is not the pictures themselves, but insight. . . . Information visualization is part of the new media made possible by the development of the real-time visual computer."[51] Such a medium can potentially expedite the search for information, enhance the recognition of patterns, and enable the use of "perceptual inference and perceptual monitoring." In addition, the medium itself can facilitate information interaction and manipulation.[52] Succinctly stated, "information visualization is a highly efficient way for the mind to directly perceive data and discover knowledge and insight from it."[53]

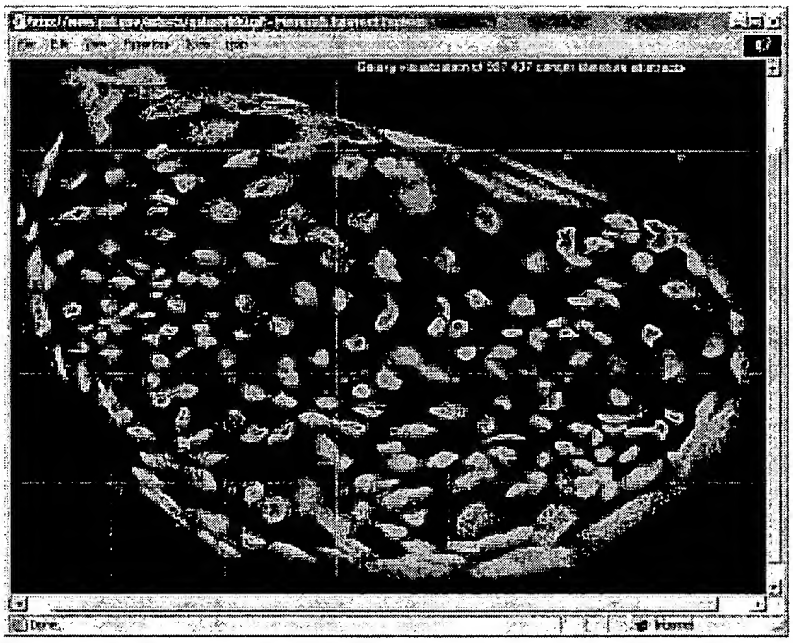
SPIRE™

One of the major research centers in the United States involved with the development and application of information visualization technologies is the Pacific Northwest National Laboratory (PNNL) based in Richland, Washington. Among its notable projects is SPIRE™–the Spatial Paradigm for Information and Exploration, a suite of information visualization tools intended to help users "explore a large number of textual documents with an intuitive spatial metaphor."[54] Of the varied SPIRE technologies (www.pnl.gov/infoviz/spire/spire.html), Galaxies and ThemeView™ are particularly noteworthy.[55]

The Galaxies visualization (www.pnl.gov/infoviz/spire/spirehelp/pages/visualizations_galaxies.html) "uses the image of stars in the night sky to represent a set of documents. [In this presentation], [e]ach document is represented by a single 'docustar.' [Documents that are closely related] . . . cluster together, while unrelated documents are separated by large distances. [In Galaxies], [s]everal analytical tools are provided . . . [that] allow users to investigate . . . document groupings, query the document contents, and investigate time-based trends" (see Figure 21).[56]

In the ThemeView™ visualization (formerly ThemeScape™) (www.pnl.gov/infoviz/spire/spirehelp/pages/visualizations_themeview.html), "the topics or themes within a set of documents are shown as a relief map of natural ter-

FIGURE 21. A Galaxies visualization of more than a half-million cancer literature abstracts.



rain: The mountains in the ThemeView indicate dominant themes. The height of the peaks indicates the relative strengths of the topics in the document set. Similar themes appear close together, while unrelated themes are separated by larger distances. ThemeView provides a visual overview of the major topics contained in a set of documents" (see Figure 22).[57] Concisely described, a ThemeView visualization is

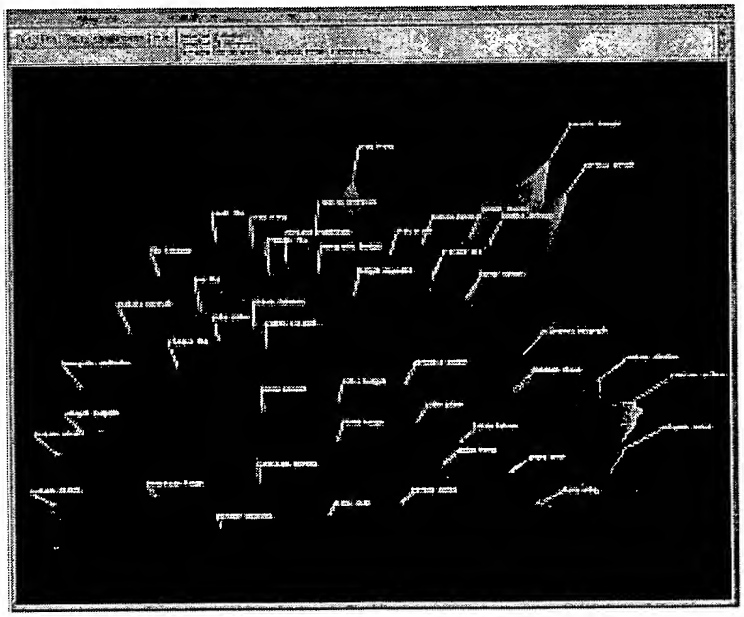
> a 3-D feature map that shows where major concepts and themes are located in . . . [a] database. Through a simple image, ThemeView visualizations can summarize the contents of an entire database, identify where major concepts are located, and detail the interrelationships between them. Combined with the thematic query tool, a ThemeView display becomes both a visual and interactive approach to exploring database contents.[58]

THE FUTURE IS NOW!

Although only a select number of electronic journal collections currently offer innovative and novel interfaces, one can expect that such enhancements will soon become commonplace as digital collections become larger and more complex, and the need for advanced navigation features and functionalities becomes more widely recognized. Likewise, as computer processing and communication technologies continue to improve, one can predict that two-dimensional visualized e-journal interfaces in time will be superseded by three-dimensional interfaces such as those offered by ThemeView, and similar technologies.[59, 60, 61, 62, 63]

One could envision, for example, the next-generation HighWire Press TopicMap as a TopicLandscape. In such a ThemeView transformation, broad and general topics and lower-level subtopics would be presented as labeled peaks, plateaus, and valleys, permitting a user to readily identify and navigate

FIGURE 22. A ThemeView visualization depicting major and minor themes and topics and their relationships as peaks, plateaus, and valleys within a sample document corpus.



the dominant and subordinate themes for an entire digital corpus, or one of its sectors. Within this digital landscape, a user could easily browse related topics or directly retrieve documents of interest, at any level. As an adjunct, or separately, a Citation Galaxy or Citation ContourMap would permit the user to navigate key and related citations for a specific topic in two or three dimensions, and then subsequently display the associated full-text articles within a right-hand frame, or a separate window. While such functionalities and features are not currently offered by HighWire Press, or other e-journal vendors, it is not unreasonable to believe that such New Age Navigation could emerge as the next-generation interface for e-collections in the not-too-distant future.

NOTES

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- Figures 4 and 5: Soizick Lesteven, Computer Engineer, Centre de Données Astronomiques de Strasbourg (CDS) (Images copyright CDS);
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- Figures 7 through 14: John Sack, Director HighWire Press®, Stanford University;
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REFERENCES

1. Eliot, *The Rock, A Pageant Play Written for Performance at Sadler's Wells Theatre 28 May-9 June 1934 on Behalf of the Forty-five Churches Fund of the Diocese of London, Book of Words* (London: Faber and Faber1934), verse 1, lines 15-16. Also available at: <http://www.cofc.edu/~betwill/Lib105/TSEliot.html> (December 28, 2002).

2. Amy Friedlander, "From the Editor: A Word (or Two) of Welcome," *D-Lib Magazine* (July 1995) <http://www.dlib.org/dlib/July95/07editorial.html> (3 November 2002).

3. Junliag Zhang, Javed Mostafa, and Himansu Tripathy, "Information Retrieval by Semantic Analysis and Visualization of the Concept Space of *D-Lib® Magazine*," *D-Lib Magazine*, 8, no. 10 (October 2002). <http://www.dlib.org/dlib/october02/zhang/10zhang.html> (3 November 2002).

4. Zhang, Mostafa, and Tripathy, "Information Retrieval by Semantic Analysis and Visualization."

5. Ibid.

6. Federation of Astronomical and Geophysical Data Analysis Services, "Centre de Données astronomiques de Strasbourg (CDS)," n.d. <http://www.kms.dk/fags/ps10cds.htm> (8 December 2002).

7. Teuvo Kohonen, *Self-Organizing Maps*. 3d ed. (Berlin: Springer, 2001).

8. Gerry McKiernan, "The NASA Astrophysics Data System Abstract Service: Astronomy," *Library Hi Tech News* 18, no. 7: (August 2001): 30-38.

9. Phillipe Poinçot, Soizick Lesteven, and Fionn Murtagh, "A Spatial User Interface to the Astronomical Literature," *Astronomy & Astrophysics. Supplement Series* 130: (May 1998) 183-191. Available at: <http://www.edpsciences-usa.org/articles/astro/pdf/1998/10/ds1464.pdf> (27 October 2002).

10. Phillipe Poinçot, Soizick Lesteven, and Fionn Murtagh, "Maps of Information Spaces: Assessments from Astronomy," *Journal of the American Society for Information Science* 51, no. 12 (October 2000): 1081-1089.

11. Institute of Physics, "About the Institute of Physics. Objectives," c2002. <http://about.iop.org/IOP/objectives.html> (10 November 2002).

12. Institute of Physics, "Electronic Journals from Institute of Physics Publishing: Current Journal by Title," c2002. <http://www.iop.org/EJ/S/3/632/> (10 November 2002).

13. Institute of Physics, "IOP Physics Reviews," c2002. <http://www.iop.org/ EJ/S/3/632/EdcpHimpqm1I1lYMw6,kNQ/ejs_extra/-coll=rev> (10 November 2002).

14. Institute of Physics, "BEC Matters!," c2002. <http://www.iop.org/EJ/S/3/632/EdcpHimpqm1I1lYMw6,kNQ/ejs_extra/-coll=becm> (10 November 2002).

15. Institute of Physics, "IOP Journal Archive News Update," c2002. <http://www.iop.org/EJ/S/3/632/BSzOWcNt.,HdHO1ZRVuYXw/help/-topic=freearchive/main/-list=all> (10 November 2002).

16. Institute of Physics, "Help: Search results: Clustering with Vivisimo," c2002. <http://www.iop.org/EJ/S/3/632/h,xztEXFE2crpBFOb72n2Q/help/-topic=cluster/search> (2 December 2002).

17. Institute of Physics, "Help: Search Results: Clustering with Vivisimo."

18. Vivísimo, "Company. Corporate Profile," c2002. <http://vivisimo.com/about/Corporate_Profile.html> (10 November 2002).

19. Frances C. Wilkinson, Nancy K. Dennis, and Barbara S. Rosen, "Back to the Future: At Last Librarians Chart a New Course in Scholarly Electronic Publishing," *Against the Grain* 9, no. 5 (November 1997): 80. Also available at: <http://www-sul.stanford.edu/staff/pubs/atg.html> (7 December 2002).

20. HighWire Press, "HighWire Press: A Brief Introduction," c2002. <http://highwire.stanford.edu/about/intro.dtl> (11 November 2002).

21. HighWire Press, "About Our New Site: HighWire," c2002. <http://highwire.stanford.edu/about/site.dtl> (11 November 2002).

22. HighWire Press, "Browse Journals By Topics," c2002. <http://highwire.stanford.edu/lists/allsites.dtl?view=by+topic> (11 November 2002).

23. HighWire Press, "Upcoming Journals," c2002. <http://highwire.stanford.edu/lists/future.dtl> (11 November 2002).
24. HighWire Press, "Browse Journals By Topics," c2002. <http://highwire.stanford.edu/lists/allsites.dtl?view=by+topic> (11 November 2002).
25. HighWire Press, "About Our New Site: HighWire," c2002. <http://highwire.stanford.edu/about/site.dtl> (11 November 2002).
26. HighWire Press, "HighWire Press: A Brief Introduction," c2002. <http://highwire.stanford.edu/about/intro.dtl> (11 November 2002).
27. HighWire Press, "Original Prospectus," c2002. <http://www.highwire.org/about/original_info.dtl> (13 November 2002).
28. Entrieva, "About Entrieva," n.d. <http://www.entrieva.com/entrieva/about/index.asp?Hdr=about> (6 December 2002).
29. HighWire Press, "TopicMap," c2002. <http://highwire.stanford.edu/help/hbt/index.dtl> (23 November 2002).
30. Inxight Software Inc., "Questions about Inxight Software Inc." <http://www.inxight.com/pdfs/inxight_corp_faq.pdf > (23 November 2002).
31. HighWire Press, "TopicMap."
32. Ibid.
33. HighWire Press, "Citation Map," n.d. <http://www.highwire.org/help/pop/citemap.dtl> (26 February 2003).
34. Ibid.
35. HighWire Press, "Instant Index," n.d. <http://www.highwire.org/help/pop/instantindex.dtl> (27 February 2003).
36. London Business School, "Welcome to the Library," n.d. <http://www.london.edu/library/> (17 November 2002).
37. London Business School, "London Classification of Business Studies," n.d. <http://www.london.edu/library/Print_Resources/LCBS/lcbs.html/> (17 November 2002).
38. Utrecht University, "About Utrecht University," 2002. <http://www.uu.nl/uupublish/homeuu/homeenglish/aboututrechtuniv/4469main.html> (20 November 2002).
39. Utrecht University, "Faculties," 2002. <http://www.uu.nl/uupublish/homeuu/homeenglish/faculties/4476main.html> (20 November 2002).
40. Utrecht University, "Facts and Figures," 2002. <http://www.uu.nl/uupublish/homeuu/homeenglish/aboututrechtuniv/factsandfigures/4473main.html> (20 November 2002).
41. Utrecht University, "Medicine, "2002. <http://www.library.uu.nl/library/disciplines/medicine/16389main.html> (9 December 2002).
42. MediaLab, "This is MediaLab," n.d. <http://www.medialab.nl/engels/about/index.html> (10 December 2002).
43. MediaLab, "To Search Is to Find and to Discover with the AquaBrowser, n.d. <http://www.medialab.nl/engels/liquid/documenten/aquabrowser.doc> (20 November 2002).
44. Ibid.
45. Ibid.
46. Ibid.
47. Ibid.
48. MediaLab, "Connecting Data," MediaLab Newsletter no. 3 (November 2002). <http://www.medialab.nl/mailing/mailing3.html> (27 February 2003).

49. Katy Börner and Chaomei Chen, "Visual Interfaces to Digital Libraries–The First International Workshop at the First ACM+IEEE Joint Conference on Digital Libraries," *D-Lib Magazine* 7, no. 7/8 (July/August 2001) <http://www.dlib.org/dlib/july01/07inbrief.html > (20 December 2002).

50. Börner and Chen, "Visual Interfaces to Digital Libraries–The First International Workshop at the First ACM+IEEE Joint Conference on Digital Libraries."

51. Ibid.

52. Stuart K. Card, Jock D. Mackinlay, and Ben Shneiderman, "Conclusion," in *Readings in Information Visualization: Using Vision to Think* (San Francisco: Morgan Kaufman, 1999), 637.

53. Pacific Northwest National Laboratory, "About Visualization at PNNL," 1999. <http://www.pnl.gov/infoviz/about.html> (20 December 2002).

54. Chaomei Chen, *Information Visualisation and Virtual Environments* (London, New York: Springer, 1999), 110.

55. James A. Wise, "The Ecological Approach to Text Visualization," *Journal of the American Society for Information Science* 50, no. 13 (November 1999): 1224-1233.

56. Pacific Northwest National Laboratory, "Our Technologies: Galaxies," 2000. <http://www.pnl.gov/infoviz/technologies> (21 December 2002).

57. Pacific Northwest National Laboratory, "Our Technologies: ThemeView™," 2000. <http://www.pnl.gov/infoviz/technologies> (21 December 2002).

58. Pacific Northwest National Laboratory, "The ThemeView Visualization," n.d. <http://www.pnl.gov/infoviz/technologies> (21 December 2002).

59. Stuart K. Card, Jock D. Mackinlay, and Ben Shneiderman, *Readings in Information Visualization.*

60. Chen, *Information Visualisation and Virtual Environments.*

61. Gerry McKiernan and Peter Wasilko, "The Big Picture(sm): Visual Browsing in Web and non-Web Databases," 1999. <http://www.public.iastate.edu/~CYBERSTACKS/BigPic.htm> (25 December 2002).

62. Michael Reed and Dan Heller (Editors), "OLIVE, the On-line Library of Information Visualization Environments," 1997. <http://www.otal.umd.edu/Olive/> (December 28, 2002).

63. Robert Spence, *Information Visualization* (Harlow: Addison-Wesley, 2001).

File 347:JAPIO Nov 1976-2004/May(Updated 040903)
(c) 2004 JPO & JAPIO
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200458
(c) 2004 Thomson Derwent

Set	Items	Description
S1	1361428	WORTH? OR VALUE? ? OR VALUATION? OR VALUING OR PARVALUE? OR MARKETVALUE? OR STREETVALUE? OR FACEVALUE?
S2	991350	GROW??? ? OR EXPAND? OR EXPANSION? OR VOLUME OR TREND?
S3	621	S1:S2(3N)(PATENT? OR IP OR INTELLECTUAL()PROPERT?)
S4	18922	S1:S2(3N)(COPYRIGHT? OR COPY()RIGHT??? ? OR TRADEMARK? OR TRADE()(MARK? ? OR MARKED OR MARKING))
S5	706420	SCIENTIFIC OR RESEARCH OR ENGINEERING OR TECHNICAL
S6	1173578	CHEMICAL OR BIOTECH? OR HIGHTECH? OR (HIGH OR HI OR BIO)()(TECH OR TECHNOLOG??? ?) OR HITECH? OR BIOMED? OR MEDICAL OR BIO()(MED OR MEDICAL)
S7	13501	S5:S6(3W)(DATA OR INFORMATION OR NPL OR DISSERTATION? OR LITERATURE OR MONOGRAPH? OR PUBLICATION? OR ARTICLE? ?)
S8	155	S5:S6(3W)(BOOK? ? OR TEXT? ? OR TEXTUAL OR TEXTBOOK?)
S9	118610	MAP OR MAPS OR MAPED OR MAPPED OR MAPING? ? OR MAPPING? ? OR TOPOGRAPH? OR CHART? ? OR CHARTED OR CHARTING? ? OR CHOROGRAPH?
S10	107990	CARTOGRAPH? OR GRAPH OR GRAPHS OR GRAPHIC?
S11	12796	S1:S2(5N)(MODEL??? ? OR MODELL??? ? OR PREDICT? OR FORETELL? OR FORECAST? OR FORE()(TELL??? ? OR CAST??? ?) OR PROSPECTIVE?)
S12	18103	S1:S2(5N)(ESTIMAT? OR PROGNOS? OR SPECULAT? OR PRESAG??? ? OR PROBABILIT? OR VATICINAT? OR FORSEE? OR FORTELL? OR FORCAST? OR PREVIS?)
S13	3659	S1:S2(5N)(PROPHES? OR PROJECT? ? OR PROJECTED OR PROJECTING OR EXTRAPOLAT?)
S14	3596	S1:S2(5N)PROJECTION? ?
S15	93	S1:S2(3N)S7:S8
S16	457	(S3:S4 OR S15) AND (S9:S10 OR VISUALIS? OR VISUALIZ? OR VISUAL)
S17	25	S16 AND S11:S14
S18	25	IDPAT (sorted in duplicate/non-duplicate order)
S19	25	IDPAT (primary/non-duplicate records only)

19/9/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015950200 **Image available**
WPI Acc No: 2004-108041/200411
XRPX Acc No: N04-085931
Calculation method for computing estimated value probability **distribution curve, involves calculating** estimated value probability **distribution curve using statistical analysis of Patent and Trademark Office maintenance fee records**
Patent Assignee: BARNEY J A (BARN-I)
Inventor: BARNEY J A
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20040010393	A1	20040115	US 2002367425	P	20020325	200411 B
			US 2003397053	A	20030325	

Priority Applications (No Type Date): US 2002367425 P 20020325; US 2003397053 A 20030325
Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes
US 20040010393 A1 13 G06F-015/00 Provisional application US 2002367425
Abstract (Basic): US 20040010393 A1

NOVELTY - The method involves calculating an **estimated value probability** distribution curve for an identified group of patent assets using statistical analysis of the Patent and Trademark Office maintenance fee records.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) a method for calculating an expected **value** for individual **patent** assets;

(b) a method for **valuing** individual **patent** assets based on determined **value probability** distribution and a calculated rating or ranking; and

(c) a method for **valuing** individual selected **patents** .

USE - For computing **estimated** value **probability** distribution curve. Used for **valuing patent** assets based on reported abandonment rates of patents sharing statistically similar attributes.

ADVANTAGE - Provides new and valuable information that can be used by **patent valuation** experts, investment advisors, economists and others to help guide future patent investment decisions, licensing programs, **patent** appraisals, tax **valuations** , transfer pricing, economic **forecasting** and planning, and even mediation and settlement of patent litigation lawsuits. Provides a purely objective approach for comparatively rating and **valuing patents** , particularly unproven **patent** assets.

DESCRIPTION OF DRAWING(S) - The figure shows the **graph** of average patent maintenance rates for a study population of about 70000 patents issued in 1986.

pp; 13 DwgNo 1/10

Title Terms: CALCULATE; METHOD; COMPUTATION; ESTIMATE; VALUE; PROBABILITY; DISTRIBUTE; CURVE; CALCULATE; ESTIMATE; VALUE; PROBABILITY; DISTRIBUTE; CURVE; STATISTICAL; ANALYSE; PATENT; OFFICE; MAINTAIN; FEE; RECORD
Derwent Class: T01
International Patent Class (Main): G06F-015/00
International Patent Class (Additional): G06F-017/18; G06F-101/14
File Segment: EPI
Manual Codes (EPI/S-X): T01-J03; T01-J05A2
?

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File   6:NTIS 1964-2004/Aug W4
         (c) 2004 NTIS, Intl Cpyrght All Rights Res
File   2:INSPEC 1969-2004/Sep W1
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         (c)2004 Japan Science and Tech Corp(JST)
File  95:TEME-Technology & Management 1989-2004/Jun W1
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         (c) 2004 The HW Wilson Co.
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         (c) 2004 ProQuest Info&Learning
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13
         (c) 2002 The Gale Group
File 603:Newspaper Abstracts 1984-1988
         (c)2001 ProQuest Info&Learning

Set     Items   Description
S1    4095421   WORTH? OR VALUE? ? OR VALUATION? OR VALUING OR PARVALUE? OR
               MARKETVALUE? OR STREETVALUE? OR FACEVALUE?
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               OR TOPOGRAPH? OR CHART? ? OR CHARTED OR CHARTING? ? OR CHOROG-
               RAPH?
S10    952853   CARTOGRAPH? OR GRAPH OR GRAPHS OR GRAPHIC?
S11    517582   S1:S2(5N)(MODEL??? ? OR MODELL??? ? OR PREDICT? OR FORETEL-
               L? OR FORECAST? OR FORE()(TELL??? ? OR CAST??? ?) OR PROSPECT-
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             IVE?)
S12     218260   S1:S2(5N)(ESTIMAT? OR PROGNOS? OR SPECULAT? OR PRESAG??? ?
               OR PROBABILIT? OR VATICINAT? OR FORSEE? OR FORTELL? OR FORCAS-
               T? OR PREVIS?)
S13      57609   S1:S2(5N)(PROPHES? OR PROJECT? ? OR PROJECTED OR PROJECTING
              OR EXTRAPOLAT?)
S14       9712   S1:S2(5N)PROJECTION? ?
S15       4613   S1:S2(3N)S7:S8
S16        586   (S3:S4 OR S15) AND S9:S10
S17         68   S16 AND S11:S14
S18         17   S17/2002:2004
S19         51   S17 NOT S18
S20         45   RD (unique items)
S21     916706   VISUALIS? OR VISUALIZ? OR VISUAL
S22        253   (S3:S4 OR S15) AND S21
S23         25   S22 AND S11:S14
S24          3   S23/2002:2004
S25         13   S23 NOT (S24 OR S17)
S26         11   RD (unique items)
```

? t20/7/2-4,8,10,15

20/7/2 (Item 2 from file: 6)
DIALOG(R)File 6:NTIS

2140586 NTIS Accession Number: PB99-502049/XAB
U.S. Industry and Trade Outlook 2000 (on CD-ROM with Search and Retrieval Software)
(Data file)
International Trade Administration, Washington, DC.
Corp. Source Codes: 064963000
1999 1 CD-ROM
Languages: English
Journal Announcement: GRAI9925
Contains search and retrieval software. Adobe Acrobat Reader 3.0 software is provided to view and search the data. System requirements: PC compatibles: Windows 3.1, Windows NT, or Windows 95; Macintosh: System 7. Hard disk space: 4.5 MB required. CD-ROM drive. See also PB99-500373, PB98-502024, PB99-501611, and SUB-5444. Y2K - compliant.
(A) Single concurrent network user: $125, (B) up to 5 concurrent users, $325, (C) up to 10 concurrent users, $625, and (D) 11+ concurrent users, $1250. The datafile is on one disc.
NTIS Prices: CD-ROM $125.00
Country of Publication: United States
U.S. Industry and Trade Outlook 2000 is the most widely read and respected single source guide to U.S. industry. The CD-ROM version includes the complete 650-page book and covers industry reviews and forecasts compiled from more than 100 industry analysts in the U.S. Department of Commerce. It presents recent financial performances of U.S. manufacturers and identifies emerging trends such as the increase in consortia and strategic alliances. The CD-ROM includes: the exact pages of the printed publication; and easy-to-use yet powerful search option; and a subject index hot-linked to each topic. It turns the outlook into an easy-to-use reference tool. The latest edition of Outlook introduces coverage of renewable energy technology, pollution control equipment, and other environmental products and services. It **expands** the drug, **biotechnology** , financial, and electronic **information** services areas. The Outlook includes tables, **charts** , **graphs** , and a comprehensive index. Industry analysts and telephone numbers are listed. Its contents include: 50 chapters covering most important manufacturing and nonmanufacturing sectors; New industry not previously covered such as electricity production; Expanded coverage in both manufacturing and nonmanufacturing industries and **Charts** for each chapter providing a quick look at economic and trade trends.

20/7/3 (Item 3 from file: 6)
DIALOG(R)File 6:NTIS

2109101 NTIS Accession Number: PB99-500373/XAB
U.S. Industry and Trade Outlook '99 (on CD-ROM)
(Data file)
International Trade Administration, Washington, DC.
Corp. Source Codes: 064963000
c1998 1 CD-ROM
Languages: English
Journal Announcement: GRAI9908
Adobe Acrobat Reader 3.0 software is provided to view and search the

data. System requirements: PC compatibles: Windows 3.1, NT, or 95; Macintosh: System 7. Hard disk space: 4.5 MB required. CD-ROM drive. See also PB97-503601, PB98-500424, PB98-500127, and PB98-502024. Y2K - compliant.

The datafile is on one disc. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

NTIS Prices: CD-ROM $125.00

Country of Publication: United States

U.S. Industry and Trade Outlook '99 is the most widely read and respected single source guide to U.S. industry. The CD-ROM version includes the complete 650-page book and covers industry reviews and forecasts compiled from more than 100 industry analysts in the U.S. Department of Commerce. It presents recent financial performances of U.S. manufacturers and identifies emerging trends such as the increase in consortia and strategic alliances. The CD-ROM includes: the exact pages of the printed publication; an easy-to-use yet powerful search option; a subject index hot-linked to each topic; plus all of the data used to produce the **charts** and **graphs** as Microsoft Excel spreadsheet files. It turns the outlook into an easy-to-use reference tool. The latest edition of Outlook introduces coverage of renewable energy technology, pollution control equipment, and other environmental products and services. It **expands** the drug, **biotechnology** , financial, and electronic **information** services areas. The Outlook includes tables, **charts** , **graphs** , and a comprehensive index. Industry analysts and telephone numbers are listed. Its contents include: 50 chapters covering most important manufacturing and nonmanufacturing sectors; New industry not previously covered such as electricity production; Expanded coverage in both manufacturing and nonmanufacturing industries and **Charts** for each chapter providing a quick look at economic and trade trends.

20/7/4 (Item 4 from file: 6)

2046091 NTIS Accession Number: PB97-503601/XAB

U.S. Industry and Trade Outlook '98 (on CD-ROM)

(Data file)

International Trade Administration, Washington, DC.

Corp. Source Codes: 064963000

c1997 1 CD-ROM

Languages: English

Journal Announcement: GRAI9807

Adobe Acrobat Reader 3.0 software is provided to view and search the data. System requirements: PC compatibles: Windows 3.1, Windows NT, or Windows 95; Macintosh: System 7. Hard disk space: 4.5 MB required. CD-ROM driver. See also PB97-500797, PB96-928008, PB95-243150, PB97-965301, and PB97-965801.

The datafile is on one disc. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

NTIS Prices: CD-ROM $125.00

Country of Publication: United States

U.S. Industry and Trade Outlook '98 is the successor to the U.S. Industrial Outlook -- the most widely read and respected single source guide to U.S. industry. The CD-ROM version includes the complete 650-page book and covers industry reviews and forecasts compiled from more than 100 industry analysts in the U.S. Department of Commerce. It presents recent

financial performances of U.S. manufacturers and identifies emerging trends such as the increase in consortia and strategic alliances. The CD-ROM includes: the exact pages of the printed publication; an easy-to-use yet powerful search option; a subject index hot-linked to each topic; plus all of the data used to produce the **charts** and **graphs** as Microsoft Excel spreadsheet files. It turn the outlook into an easy-to-use reference tool. The latest edition of Outlook introduces coverage of renewable energy technology, pollution control equipment, and other environmental products and services. It **expands** the drug, **biotechnology** , financial, and electronic **information** services areas. The Outlook includes tables, **charts** , **graphs** , and a comprehensive index. Industry analysts and telephone numbers are listed. Its contents include: 50 chapters covering most important manufacturing and nonmanufacturing sectors; New industry not previously covered such as electricity production; Expanded coverage in both manufacturing and nonmanufacturing industries and **Charts** for each chapter providing a quick look at economic and trade trends.

20/7/8 (Item 8 from file: 6)
DIALOG(R)File 6:NTIS

1687032 NTIS Accession Number: ED-346 870
Research Library Trends, 1951-1980 and Beyond: An Update of Purdue's 'Past and Likely Future of 58 Research Libraries.'
Seibert, W. F.
Lister Hill National Center for Biomedical Communications, Bethesda, MD.
Corp. Source Codes: 060383000
Report No.: PB-87-174280; TR-LHNCBC-87-2
Nov 88 145p
Languages: English
Journal Announcement: GRAI9302
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), 3900 Wheeler Ave., Alexandria, VA 22304-5110.
NTIS Prices: Not available NTIS
Country of Publication: United States
This research extends the 'Purdue studies' of research library growth, presenting results that include library statistical trends during a 35-year period, 1951-1985. It serves to update Purdue's 9-report series (1965-1973) and is a validation study of Purdue's **growth forecasts** , 28 of which were published in 1965, then revised in 1971. The research libraries considered here represent 58 'first tier' American research libraries that were members of the Association of Research Libraries (ARL) in 1964, when the Purdue studies began; all are members still. The results describe 35 years of growth and change in library holdings, volumes added, professional and non-professional staff size, and in three expenditure categories--salaries, materials and binding, and total, plus university/main campus total and graduate enrollments, and Ph.D. degrees awarded. Growth trends are reported for eight 'composite' libraries that differ in size, i.e., the average or mean; the median, first quartile and third quartile; and four collection (or holdings) subgroups, the 'large,' 'medium-large,' 'medium-small,' and 'small.' Correlational findings also show the strength of relationship, year-by-year, among the study variables. **Trends** and **forecasts** of 28 variable-and-composite combinations are shown in 8 tables and 28 figures. Some **estimates** of future **growth** through 1990 are presented, together with suggestions for future research. Appended materials include a listing of the nine Purdue reports; a listing of National Center for Education Statistics (NCES) data source documents; correlations of 16 variables year-by-year from 1951 to 1985 presented in the form of a conversation between two fictitious library directors, one

newly-appointed and the other (retiring; and a description of the composition of ARL subgroups based on 1985 data. (40 references) (Author/BBM).

20/7/10 (Item 10 from file: 6)
DIALOG(R)File 6:NTIS

1620987 NTIS Accession Number: N92-11936/1
Information Technologies for Astrophysics Circa 2001
Denning, P. J.
Research Inst. for Advanced Computer Science, Moffett Field, CA.
Corp. Source Codes: 095294000; RR454545
Sponsor: National Aeronautics and Space Administration, Washington, DC.
Report No.: NAS 1.26:188868; RIACS-TR-90-33; NASA-CR-188868
23 May 90 26p
Languages: English
Journal Announcement: GRAI9205; STAR3002
Presented at a NASA Workshop on Astrophysical Information Systems, Moffett Field, Ca, 23-25 May 1990.
Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: NCC2-387
It is easy to **extrapolate** current **trends** to see where technologies relating to information systems in astrophysics and other disciplines will be by the end of the decade. These technologies include mineaturization, multiprocessing, software technology, networking, databases, **graphics** , pattern computation, and interdisciplinary studies. It is easy to see what limits our current paradigms place on our thinking about technologies that will allow us to understand the laws governing very large systems about which we have large datasets. Three limiting paradigms are saving all the bits collected by instruments or generated by supercomputers; obtaining technology for information compression, storage and retrieval off the shelf; and the linear mode of innovation. We must extend these paradigms to meet our goals for information technology at the end of the decade.

20/7/15 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

6915080 INSPEC Abstract Number: C2001-06-7130-026
Title: Trend **analysis by** patent **information: patents of US class 705 through the "patent** map **"**
Author(s): Ariga, Y.; Arai, H.
Author Affiliation: Inpatec Co. Ltd., Shizuoka, Japan
Journal: Journal of Information Processing and Management vol.43, no.11 p.965-75
Publisher: Japan Science and Technology Corp,
Publication Date: Feb. 2001 Country of Publication: Japan
CODEN: JOKAAB ISSN: 0021-7298
SICI: 0021-7298(200102)43:11L.965:TAPI;1-5
Material Identity Number: G321-2001-004
Language: Japanese Document Type: Journal Paper (JP)
Treatment: Practical (P)
Abstract: The **patent** application **trend** of the business **model** patent

of USA was investigated. As a result, the field of major development by a major corporation became clear and a new technical field, related to class 705 from analysis results was found. On the other hand, it was demonstrated that patent **mapping** was an effective analytical trend method. The following conditions were necessary for this analysis. As a first handling, much patent data needed to be collected automatically. As a next handling, data format needs to be standardized. Various trend analysis needs to be done by using software. A quick analysis handling was completed finally. (6 Refs)
Subfile: C
Copyright 2001, IEE
? t20/7/16,20,23,27

20/7/16 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2004 Institution of Electrical Engineers. All rts. reserv.

6284639 INSPEC Abstract Number: C1999-08-7330-111
Title: Modeling technique based on media-axis and metaball for vessel biomedical structure
Author(s): Guo Hong-Hui; Peng Qun-Sheng; Li Jie
Author Affiliation: State Key Lab. of CAD&CG, Zhejiang Univ., Hangzhou, China
Journal: Journal of Software vol.10, no.5 p.455-61
Publisher: Science Press,
Publication Date: May 1999 Country of Publication: China
CODEN: RUXUEW ISSN: 1000-9825
SICI: 1000-9825(199905)10:5L.455:MTBM;1-6
Material Identity Number: G255-1999-006
Language: Chinese Document Type: Journal Paper (JP)
Treatment: Practical (P)
Abstract: The **modeling** of **medical volume data** has drawn public attention since traditional approaches, such as triangle tiling of the contour surface and 3D array of voxels, do not fit efficient rendering, especially for the rendering of vessel structure. In this paper, an algorithm for modeling vessel biomedical structure based on the extraction of the medial-axis and the interaction of metaballs is proposed. The paper adopts the distance transformation to extract the medial-axis, and uses the metaball to describe the structure. The results show that this model not only retains the complicated topological structure, but also assures the smooth shape of the rendering result. (11 Refs)
Subfile: C
Copyright 1999, IEE

20/7/20 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
(c) 2004 Elsevier Eng. Info. Inc. All rts. reserv.

06076750 E.I. No: EIP02256984264
Title: The use of multiscale remote sensing imagery to derive regional estimates of forest growth capacity using 3-PGS
Author: Coops, N.C.; Waring, R.H.
Corporate Source: CSIRO Forestry and Forest Products, Clayton South, Melbourne 3169, Australia
Source: Remote Sensing of Environment v 75 n 3 2001. p 324-334
Publication Year: 2001
CODEN: RSEEA7 ISSN: 0034-4257
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical); X; (Experimental)

Journal Announcement: 0207W1

Abstract: A number of process models now exist that estimate carbon and water vapor exchange across a broad array of vegetation. Many of these models can be driven with information derived from satellite sensors. In particular, a large number use the normalized difference vegetation index to infer spatial and temporal shifts in the fraction of visible light intercepted (fphi//p//.//a) by vegetation. We utilized a simplified process **model** (Physiological Principles **Predicting Growth** from Satellites), initialized with Advanced Very High Resolution Radiometer normalized difference vegetation index-derived estimates of fphi//p//.//a, to estimate at monthly time steps photosynthesis, respiration, and aboveground growth of forest vegetation within a 54,000 km**2 region in southwestern Oregon. We had data available from 755 permanent survey plots to provide an independent **estimate** of forest **growth** capacity. In addition, we took advantage of a satellite-derived classification of 14 major forest types to investigate the extent that generalizations might be made about their respective productive capacities. From weather stations and statewide soil surveys, we extrapolated and transformed these sources of data into those required to drive the model (solar radiation, temperature extremes, vapor pressure deficit, and precipitation) and initialize conditions (soil water holding capacity and soil fertility). Within the mountainous region we found considerable variation existed within each 1-km**2 pixel centered on each of the survey plots. Even by excluding comparisons where local variation was high, **model** predictions of forest **growth** compared poorly with those **estimated** from ground survey (r**2 = 0.4). This variation was only partly attributed to variation in canopy fphi//p//.//a. Local variation in climate and soils played an equal if not greater role. When the sample plots were stratified into 14 broad forest types, within which growth potential varied similarly (coefficient of variation for each of the 14 types averaged 6%), a good relation between **predicted** and measured forest **growth** capacity across all types resulted (r**2 = 0.82, P less than approximately equals 0.01, SE = 1.2 m**3 ha**-**1yr**-**1). The implications of these analyses suggest that: (1) models should be rigorously tested before applying across landscapes; (2) accuracy in locating plots and in extrapolating data limits spatial resolution; (3) soil surveys in mountainous regions are inaccurate and difficult to interpret; (4) **mapped** vegetation classifications provide a useful level of stratification; and (5) remotely sensed estimates of canopy nitrogen status and biomass increment and canopy nitrogen status are needed to improve and validate regional assessment of **growth** . Crown **Copyright** copy 2001 Published by Elsevier Science Ireland Ltd. 66 Refs.

20/7/23 (Item 4 from file: 8)

05252809 E.I. No: EIP99034600472

Title: Why is real-time volume rendering no longer a year away?

Author: Kaufman, Arie; Brady, Marty; Lorensen, Bill; Kitson, Fred; Pfister, Hanspeter

Corporate Source: State Univ of New York at Stony Brook, Stony Brook, NY, USA

Conference Title: Proceedings of the 1998 IEEE Visualization Conference

Conference Location: Research Triangle Park, NC, USA Conference Date: 19981018-19981023

Sponsor: IEEE

E.I. Conference No.: 49947

Source: Proceedings of the IEEE Visualization Conference 1998. IEEE Comp Soc, Los Alamitos, CA, USA,98CB36276. p 497-499

Publication Year: 1998
CODEN: 001061
Language: English
Document Type: CA; (Conference Article) Treatment: G; (General Review)
Journal Announcement: 9905W2
Abstract: The visualization of **scientific , engineering** or **biomedical data** is a **growing** field within computer **graphics** . Volume rendering, which encompasses an array of techniques for displaying images directly from the 3D data, has become a key technology in the visualization of volumetric data. Unlike surface-based representations, volumetric data can embody interior structures and composition. The emerging field of volume **graphics** is also using the **volume** data of geometrical **models** that have been synthesized into 3D datasets. Real-time volume rendering is no longer just a possibility as major advances address the two important issues that have limited its use: extremely computer-intensive processing and complex rendering parameters.

20/7/27 (Item 8 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

03514194 E.I. Monthly No: EIM9211-058072
Title: Raytracing of medical 3D tomographies.
Author: Meinzer, H. P.; Meetz, K.; Scheppelmann, D.
Conference Title: Proceedings of the 13th Annual International Conference of the IEEE Engineering in Medicine and Biology Society
Conference Location: Orlando, FL, USA Conference Date: 19911031
Sponsor: IEEE Engineering in Medicine & Biology Soc
E.I. Conference No.: 17015
Source: Proceedings of the Annual Conference on Engineering in Medicine and Biology v 13 pt 1. Publ by IEEE, IEEE Service Center, Piscataway, NJ, USA (IEEE cat n 91CH3068-4). p 41-42
Publication Year: 1991
CODEN: CEMBAD ISSN: 0589-1019 ISBN: 0-7803-0216-8
Language: English
Document Type: PA; (Conference Paper) Treatment: A; (Applications)
Journal Announcement: 9211
Abstract: The Heidelberg ray-tracing model is a visualization **model** for 3D **medical volume data** . To reduce the computational costs a number of simplifications to the general approach of J. T. Kajiya and B. P. Von Herzen (Computer **Graphics** , vol. 18, pp. 165-173, 1984) are made without trading image quality. The simplifying assumptions include fixed positions and a limited number of light sources. The model produces shadows and motion, does not need segmentation of surfaces and is able to show multiple, semitransparent and multicolored objects. It visualizes parallel, serial sets of 2D images, e.g., computer tomographies. The intention is to support diagnosis and therapy by making the available information accessible to the medical specialist. 4 Refs.
? t20/7/33-35,37-40,42,44

20/7/33 (Item 5 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03284880 Genuine Article#: NV424 Number of References: 40
Title: TRANSFER OF TECHNOLOGY FROM STATISTICAL JOURNALS TO THE BIOMEDICAL LITERATURE **- PAST** TRENDS **AND FUTURE** PREDICTIONS
Author(s): ALTMAN DG; GOODMAN SN
Corporate Source: IMPERIAL CANC RES FUND,MED STAT LAB,POB 123,LINCOLNS INN

FIELDS/LONDON WC2A 3PX//ENGLAND/; JOHNS HOPKINS UNIV,CTR ONCOL,DIV BIOSTAT/BALTIMORE//MD/21205
Journal: JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 1994, V272, N2 (JUL 13), P129-132
ISSN: 0098-7484
Language: ENGLISH Document Type: ARTICLE
Abstract: Objective.-To investigate the speed of the transfer of new statistical methods into the medical literature and, on the basis of current data, to predict what methods medical journal editors should expect to see in the next decade.

Design.-Influential statistical articles were identified and the time pattern of citations in the medical literature was ascertained. In addition, longitudinal studies of the statistical content of articles in medical journals were reviewed.

Main Outcome Measures.-Cumulative number of citations in medical journals of each article in the years after publication.

Results.-Annual citations show some evidence of decreasing lag times between the introduction of new statistical methods and their appearance in medical journals. Newer technical innovations still typically take 4 to 6 years before they achieve 25 citations in the medical literature. Few methodological advances of the 1980s seem yet to have been widely cited in medical journals. Longitudinal studies indicate a large increase in the use of more complex statistical methods.

Conclusions.-Time trends suggest that technology diffusion has speeded up during the last 30 years, although there is still a lag of several years before medical citations begin to accrue. Journals should expect to see more articles using increasingly sophisticated methods. Medical journals may need to modify reviewing procedures to deal with articles using these complex new methods.

20/7/34 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

04781054 JICST ACCESSION NUMBER: 01A0098071 FILE SEGMENT: JICST-E
Interaction with Medical Volume Data **on a** Projection **Workbench.**
LIN C-Y (1); KAKADIARIS I A (1); CHEN D T (1); SU S (1); LOFTIN R B (2)
(1) Univ. Houston, Texas; (2) Old Dominion Univ., Virginia
Int Conf Artif Real Telexistence, 2000, VOL.10th, PAGE.148-152, FIG.7, REF.23
JOURNAL NUMBER: L3621AAV ISSN NO: 1345-1278
UNIVERSAL DECIMAL CLASSIFICATION: 681.3:621.397.3:616 681.51:007.51
LANGUAGE: English COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Conference Proceeding
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication

20/7/35 (Item 2 from file: 94)
DIALOG(R)File 94:JICST-EPlus

03006491 JICST ACCESSION NUMBER: 96A0692911 FILE SEGMENT: JICST-E
Trends of main indices of research and development activities in our country. (Agency of Ind. Sci. and Tech., General Coordination Dep. S).

Agency of Ind. Sci. and Technol., Minist. of Trade and Ind.
Wagakuni no Kenkyu Kaihatsu Katsudo Shuyo Shihyo no Doko. Heisei 8nen, 1996
, PAGE.75P
JOURNAL NUMBER: N19961892W
UNIVERSAL DECIMAL CLASSIFICATION: 001.89
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Introduction article
MEDIA TYPE: Printed Publication
ABSTRACT: This document reports the data on following items in **graph** and table. Major items are as follows : 1) Macroscopic research and development trend. A) Transition of R&D expenses of Japan and major countries. B) Change of regular researcher.2) Promotion agency of R&D and flow of R&D expenses. A) Change of R&D expenditure of industry-government-university in Japan. B) Financial support of research expense for industry in major countries.3) Character of research. A) Breakdown according to the character of research expense in basic researches of Japan and major countries.4) **Trend** of **patent** . A) Change of patent application and utility **model** right in Japan.5) **Trend** of technology trade. A) Change of technology, trade and the amount in Japan.6) Trend of technology introducing. A) Change of technology introducing number in Japan.7) Trend of research and development by type of industry. A) Change of R&D expenses by type of industry in Japan.8) Buggets relating technological development in Japan.

20/7/37 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

14983568 PASCAL No.: 01-0137409
An information method for achieving value-added processing of bibliographic databases in science and technology
KARDOS Dragotin; BOH Bojana
Specialised Information Centre for Chemistry, Faculty of Natural Sciences and Engineering, University of Ljubljana, Slovenia; Department of Chemical Education and Informatics, Faculty of Natural Sciences and Engineering, University of Ljubljana, Slovenia
Journal: Online information review : (Print), 2000, 24 (4) 294-301
ISSN: 1468-4527 Availability: INIST-17093; 354000092240730030
No. of Refs.: 7 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United Kingdom
Language: English
The article presents and discusses a methodological procedure based on the functional density of information, which can be used for value-added processing of bibliographic databases with scientific and technological information to **predict** and recognise **trends** in research and development fields. The concept of functional information density can be applied in processing bibliographic databases by specific search fields, such as: number of documents by the publication year, number of articles and patents by year, patent assignee, patent applications and granted patents by country, international patents classification codes, and journal titles. The proposed information procedure was tested on the research topics microencapsulation technology, microencapsulated pesticides, microencapsula ted repellents and superabsorbents, and was used as an information support for design of research hypotheses, planning of research, development and marketing of products.

20/7/38 (Item 2 from file: 144)
DIALOG(R)File 144:Pascal

13466817 PASCAL No.: 98-0163516
Growth **of** research literature **in scientific specialities. A modelling perspective**
GUPTA B M; SHARMA P; KARISIDDAPPA C R
PERITZ Bluma C, ed; EGGHE Leo, ed; GLAENZEL Wolfgang, ed
Scientometrics and Informetrics Group, National Institute of Science, Technology and Development Studies, Dr K. S. Krisnnan Marg, New Delhi 110012, India; Department of Library & Information Science, Karnataka University, Dharwad 580003, India
Hebrew University, School of Library, Archive and Information Studies, Jerusalem, Israel; Limburgs Universitair Centrum, Belgium; Research Association for Science Communication and Information e.V. (RASCI), Johannes-Kepler-Weg 5, 15236 Frankfurt (Oder), Germany; Information Science and Scientometrics Research Unit (ISSRU), Library of the Hungarian Academy of Sciences, P.O. Box 1002, 1245 Budapest, Hungary
International Society for Scientometrics and Informetrics, International.
Conference of the International Society for Scientometrics and Informetrics, 6 (Jerusalem ISR) 1997-06-16
Journal: Scientometrics, 1997, 40 (3) 507-528
ISSN: 0138-9130 CODEN: SCNTDX Availability: INIST-19049; 354000077654400110
No. of Refs.: 35 ref.
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: Netherlands
Language: English
The paper discusses the application of three well known diffusion models and their modified versions to the growth of publication data in four selected fields of S&T. It is observed that all the three models in their modified versions generally improve their performance in terms of parameter values, fit statistics, and **graphical** fit to the data. The most appropriate model is generally seen to be the modified exponential-logistic model.

20/7/39 (Item 3 from file: 144)
DIALOG(R)File 144:Pascal

12390799 PASCAL No.: 96-0038230
Knowledge epidemics in the growth of physics
ISSI '95 : proceedings of the fifth biennial international conference of the International Society for Scientometrics and Infometrics : River Forest IL, June 7-10, 1995
TABAH A N
KOENIG Michael ED, ed; BOOKSTEIN Abraham, ed
Univ. Montreal, Montreal, Canada
Rosary College. Graduate School of Library & Information Science, USA.
International Society for Scientometrics and Informetrics. International conference, 5 (River Forest IL USA) 1995-06-07
1995 555-564
Publisher: Learned Information, Medford NJ
Availability: INIST-Y 30858; 354000053483300540

No. of Refs.: 10 ref.
Document Type: C (Conference Proceedings) ; A (Analytic)
Country of Publication: USA
Language: English

The purpose of this work is to propose a new dichotomy for epidemic growth in scientific specialties and to provide a case study to support the contention. Epidemics are generally caused by influential works that attract new authors into a field and incites them to publish extensively. Information epidemics are temporary occurrences ; they produce a blip on a time series **chart** of growth, and the activity in the field subsides to an earlier level. Knowledge epidemics contribute significantly to knowledge growth and become the precursors of new specialties. Based on these premises, the monthly output in each classification chapter of Physics Abstracts was surveyed for 1977-1987. The time series **charts** were examined for epidemic growth patterns, and several case studies were retained. The case of superconductivity is presented here in detail. The results of this and future work are expected to contribute to a theory of fast growing literatures as well as library collection development policies.

20/7/40 (Item 4 from file: 144)
DIALOG(R)File 144:Pascal

11322943 PASCAL No.: 94-0144103
Growth patterns in the National Library of Medicine's serials collection and in Index Medicus SUP (R) journals, 1966-1985
HUMPHREYS B L; MCCUTCHEON D E
National library medicine, Bethesda MD 20894, USA
Journal: Bulletin of the Medical Library Association, 1994, 82 (1) 18-24
ISSN: 0025-7338 CODEN: BMLAAG Availability: INIST-9627; 354000024920730020
No. of Refs.: 13 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: USA
Language: English

Data from the National Library of Medicine (NLM) automated Master Serials System and its MEDLINE (R) database were used to **chart** the growth of NLM's serials collection and of the journals indexed in Index Medicus (R) from 1966 to 1985. The number of live serial titles in the subset of NLM's collection examined increased 30% in the twenty years. The average number of articles per Index Medicus journal increased 56%. The average number of articles in U.S. Index Medicus journals grew more rapidly than the average number in journals published elsewhere. The NLM data provide clear evidence that the years from 1966 to 1985 saw a substantial increase in the percentage of the biomedical serial literature published in English. The period from 1966 to 1985 saw substantial but uneven growth in the number of serial titles in the NLM collection and in the average number of articles in Index Medicus journals

20/7/42 (Item 1 from file: 202)
DIALOG(R)File 202:Info. Sci. & Tech. Abs.

3302773
Growth **of** research literature **in scientific specialties. A modelling perspective.**
Author(s): Gupta, B M; Karisiddappa, C R

Corporate Source: National Inst of Science, New Delhi
Scientometrics vol. 40, no. 3, pages 507-528
Publication Date: Nov-Dec 1997
ISSN: 0138-9130
Language: English
Document Type: Journal Article
Record Type: Abstract
Journal Announcement: 3300

The applicability of six well-established diffusion **models** to the **growth** of publication data in four subject fields in the area of science and technology is examined. Focus is given to determining the applicability of parameter values, fit statistics, and **graphical** fit to the data, and it is found that the three basic models in their modified versions improve their performance in terms of these criteria. The modified exponential-logistic model is found to be the most appropriate model.

26/7/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6663792 INSPEC Abstract Number: C2000-09-7250C-005
Title: BibRelEx: exploring bibliographic databases by visualization **of annotated content-based relations**
Author(s): Bruggemann-Klein, A.; Klein, R.; Landgraf, B.
Author Affiliation: Tech. Univ. Munchen, Germany
Conference Title: 2000 IEEE Conference on Information Visualization. An International Conference on Computer Visualization and Graphics p.19-24
Editor(s): Banissi, E.; Bannatyne, M.; Chen, C.; Khosrowshahi, F.; Sarfraz, M.; Ursyn, A.
Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA
Publication Date: 2000 Country of Publication: USA xvi+606 pp.
ISBN: 0 7695 0743 3 Material Identity Number: XX-2000-01701
U.S. Copyright Clearance Center Code: 0 7695 0743 3/2000/$10.00
Conference Title: Proceedings IEEE International Conference on Information Visualization
Conference Date: 19-21 July 2000 Conference Location: London, UK
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P)
Abstract: Traditional searching and browsing functions for bibliographic databases no longer enable researchers to deal efficiently with the rapidly **growing** number of **scientific publications** . Our **project** BibRelEx aggregates expert knowledge on a body of scientific literature and makes it available to researchers who wish to explore the literature. We take a two-pronged approach. First, we collect expert annotations on publications and their semantic relationships to other publications. Second, we let researchers explore this semantically enriched body of literature and knowledge through **visualizations** . Hence, we enable researchers to track relevant documents based on their colleagues' expertise. We are testing our approach with a bibliographic database in a computational geometry. (14 Refs)
Subfile: C

26/7/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

5729737 INSPEC Abstract Number: C9712-7330-063
Title: Real-time volume visualization **of** medical **image** data **for diagnostic and navigational purposes in computer aided surgery**
Author(s): Hubner, M.; Kuhnapfel, U.G.
Author Affiliation: Inst. fur Angewandte Inf., Forschungszentrum Karlsruhe GmbH, Germany
Conference Title: CAR '96 Computer Assisted Radiology. Proceedings of the International Symposium on Computer and Communication Systems for Image Guided Diagnosis and Therapy p.751-6
Editor(s): Lemke, H.U.; Vannier, M.W.; Inamura, K.; Farman, A.G.
Publisher: Elsevier, Amsterdam, Netherlands
Publication Date: 1996 Country of Publication: Netherlands xxxv+1112 pp.
ISBN: 0 444 82497 9 Material Identity Number: XX96-02119
Conference Title: Proceedings of CAR'96: Computer Assisted Radiology-10th International Symposium
Conference Date: June 1996 Conference Location: Paris, France
Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P)

Abstract: Three dimensional reconstruction of medical image data becomes more and more important for diagnostic tasks, operational pre planning, and for the online navigational support during surgical operations. The development of modern medical imaging equipment-especially the progression of fast tomographs-makes it possible to monitor the position of surgical instruments during an operation. To support and improve such activities, Forschungszentrum Karlsruhe has developed a software module to **visualize** and interactively manipulate a wide range of **medical volume data** like MR or CT datasets as well as true colored volume data as it can be derived e.g. from the "Visible Human" project. The module has been integrated in the simulation system `KISMET', which allows for easy and fast combination of **medical volume data** with CAD type **models** of surgical instruments. (6 Refs)

Subfile: C

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File 348:EUROPEAN PATENTS 1978-2004/Sep W01
(c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20040909,UT=20040902
(c) 2004 WIPO/Univentio

Set	Items	Description
S1	664649	WORTH? OR VALUE? ? OR VALUATION? OR VALUING OR PARVALUE? OR MARKETVALUE? OR STREETVALUE? OR FACEVALUE?
S2	705995	GROW??? ? OR EXPAND? OR EXPANSION? OR VOLUME OR TREND?
S3	7134	S1:S2(3N)(PATENT? OR IP OR INTELLECTUAL()PROPERT?)
S4	536	S1:S2(3N)(COPYRIGHT? OR COPY()RIGHT??? ? OR TRADEMARK? OR TRADE()(MARK? ? OR MARKED OR MARKING))
S5	501847	SCIENTIFIC OR RESEARCH OR ENGINEERING OR TECHNICAL
S6	504330	CHEMICAL OR BIOTECH? OR HIGHTECH? OR (HIGH OR HI OR BIO)()(TECH OR TECHNOLOG??? ?) OR HITECH? OR BIOMED? OR MEDICAL OR BIO()(MED OR MEDICAL)
S7	38323	S5:S6(3W)(DATA OR INFORMATION OR NPL OR DISSERTATION? OR LITERATURE OR MONOGRAPH? OR PUBLICATION? OR ARTICLE? ?)
S8	2337	S5:S6(3W)(BOOK? ? OR TEXT? ? OR TEXTUAL OR TEXTBOOK?)
S9	225626	MAP OR MAPS OR MAPED OR MAPPED OR MAPING? ? OR MAPPING? ? OR TOPOGRAPH? OR CHART? ? OR CHARTED OR CHARTING? ? OR CHOROGRAPH?
S10	231211	CARTOGRAPH? OR GRAPH OR GRAPHS OR GRAPHIC?
S11	26089	S1:S2(5N)(MODEL??? ? OR MODELL??? ? OR PREDICT? OR FORETELL? OR FORECAST? OR FORE()(TELL??? ? OR CAST??? ?) OR PROSPECTIVE?)
S12	28403	S1:S2(5N)(ESTIMAT? OR PROGNOS? OR SPECULAT? OR PRESAG??? ? OR PROBABILIT? OR VATICINAT? OR FORSEE? OR FORTELL? OR FORCAST? OR PREVIS?)
S13	6049	S1:S2(5N)(PROPHES? OR PROJECT? ? OR PROJECTED OR PROJECTING OR EXTRAPOLAT?)
S14	3097	S1:S2(5N)PROJECTION? ?
S15	531	S1:S2(3N)S7:S8
S16	177	(S3:S4 OR S15)(25N)(S9:S10 OR VISUALIS? OR VISUALIZ? OR VISUAL)
S17	5	S16(25N)S11:S14

17/5,K/3 (Item 2 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00974203
SIMULTANEOUS INTELLECTUAL PROPERTY SEARCH AND VALUATION SYSTEM AND METHODOLOGY (SIPS-VSM)
RECHERCHE SIMULTANEE EN PROPRIETE INTELLECTUELLE ET SYSTEME ET METHODOLOGIE D'EVALUATION (SIPS-VSM)
Patent Applicant/Inventor:
GRUNE Guerry Leonard, 784 S. Villiers Ct., Virginia Beach, VA 23452, US, US (Residence), US (Nationality)
PLANTE Douglas R, 3420 Sea Horse Way, Virginia Beach, VA 23452, US, US (Residence), US (Nationality)
TSANG Yven Sun, 1168 Birks Lane, Virginia Beach, VA 23464, US, US (Residence), US (Nationality)
Legal Representative:
GRUNE Guerry L (agent), 784 S. Villier Ct., Virginia Beach, VA 23452, US,

Patent and Priority Information (Country, Number, Date):
Patent: WO 200303254 A1 20030109 (WO 0303254)
Application: WO 2002US20601 20020627 (PCT/WO US0220601)
Priority Application: US 2001896238 20010629

Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI
SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: G06F-017/30
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 7639

English Abstract
A system, method, and computer-based logic flow for a web-enabled tool that allows simultaneous intelligent searching, knowledge management based problem solving, valuation, and modeling of intellectual property and scientific information are described herein. The system accesses databases of intellectual property and scientific information. Additionally, the computer-based logic flow utilizes valuation techniques based on the Blach-Sholes Options Pricing model or discounted cash flow methods. Such access may be obtained through a wireless technology with an operating system designed to utilize the SIPS-VSM tool.

French Abstract
L'invention concerne un systeme, une methode, et un flot logique informatise destines a un outil mis en oeuvre par Internet qui permet d'effectuer une recherche intelligente simultanee, une gestion des connaissances fondee sur la resolution de problemes, une evaluation, et une modelisation de donnees de propriete intellectuelle ou scientifiques. Le systeme accede a des bases de donnees de propriete intellectuelle ou scientifiques. En outre, le flot logique informatise met en oeuvre des techniques d'evaluation fondees sur le modele d'etablissement des prix d'options de Blach-Sholes ou sur les methodes de l'actualisation des flux de tresorerie. Cet acces peut s'effectuer par une technologie sans fil a l'aide d'un systeme d'exploitation concu pour utiliser l'outil SIPS-VSM.

Legal Status (Type, Date, Text)
Publication 20030109 A1 With international search report.
Fulltext Availability:
Detailed Description
Claims

Detailed Description
... Figure 7(f).

Display of Results
Patent and Claim Information
The program allows for simultaneous **modeling** of the **valuation** and **intellectual property** results. The results may be displayed in various **graphical** formats. Hyperbolic trees allow for the display of information on a hyperbolic plane using a...

Claim
... for enabling a simultaneous combination of techniques including

intelligent searching for, problem solving with, and **valuation** of **intellectual property** , while providing **model mapping** of said techniques' results regarding said intellectual property in a meaningful manner with a user...said technology exchange, said problem solving database, and said science and engineering database, resulting in **model mapping** and **valuing** said **intellectual property** according to one or more search criteria specified by a ...wherein any permutation and combination regarding techniques includes intelligent searching for, problem solving with, and **valuation** of **intellectual property** , while providing **model mapping** of said intelligent searching and valuation results is optionally simultaneous and optionally includes a simpler...

...claim 1, wherein said combination of techniques including intelligent searching for, problem solving with, and **valuation** of **intellectual property** , while providing **model mapping** of said intelligent searching and valuation results is optionally simultaneous and optionally includes a simpler combination whereby only intelligent searching together with **valuation** of **intellectual property** while providing **model mapping** is provided.

5 The computer system of claim 1, wherein a second simpler combination includes problem solving using Imowledge management based systems together with **valuation** of **intellectual property** based systems while providing model **mapping** .

6 The computer system of claim 1, wherein a third simpler combination includes electronic patent...

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File 696:DIALOG Telecom. Newsletters 1995-2004/Sep 13
(c) 2004 The Dialog Corp.
File 15:ABI/Inform(R) 1971-2004/Sep 13
(c) 2004 ProQuest Info&Learning
File 98:General Sci Abs/Full-Text 1984-2004/Jul
(c) 2004 The HW Wilson Co.
File 112:UBM Industry News 1998-2004/Jan 27
(c) 2004 United Business Media
File 141:Readers Guide 1983-2004/Jul
(c) 2004 The HW Wilson Co
File 484:Periodical Abs Plustext 1986-2004/Aug W5
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File 553:Wilson Bus. Abs. FullText 1982-2004/Jul
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File 608:KR/T Bus.News. 1992-2004/Sep 14
(c)2004 Knight Ridder/Tribune Bus News
File 813:PR Newswire 1987-1999/Apr 30
(c) 1999 PR Newswire Association Inc
File 613:PR Newswire 1999-2004/Sep 13
(c) 2004 PR Newswire Association Inc
File 635:Business Dateline(R) 1985-2004/Sep 11
(c) 2004 ProQuest Info&Learning
File 810:Business Wire 1986-1999/Feb 28
(c) 1999 Business Wire
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(c) 2004 Reed Business Information Ltd.
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(c) 2004 The Dialog Corp.
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(c) 2004 McGraw-Hill Co. Inc
File 634:San Jose Mercury Jun 1985-2004/Sep 13
(c) 2004 San Jose Mercury News
File 647:CMP Computer Fulltext 1988-2004/Sep W1
(c) 2004 CMP Media, LLC
File 674:Computer News Fulltext 1989-2004/Aug W4
(c) 2004 IDG Communications

Set	Items	Description
S1	7592049	WORTH? OR VALUE? ? OR VALUATION? OR VALUING OR PARVALUE? OR MARKETVALUE? OR STREETVALUE? OR FACEVALUE?
S2	12612472	GROW??? ? OR EXPAND? OR EXPANSION? OR VOLUME OR TREND?
S3	43004	S1:S2(3N)(PATENT? OR IP OR INTELLECTUAL()PROPERT?)
S4	15684	S1:S2(3N)(COPYRIGHT? OR COPY()RIGHT??? ? OR TRADEMARK? OR TRADE()(MARK? ? OR MARKED OR MARKING))
S5	7748334	SCIENTIFIC OR RESEARCH OR ENGINEERING OR TECHNICAL
S6	4598882	CHEMICAL OR BIOTECH? OR HIGHTECH? OR (HIGH OR HI OR BIO)()(TECH OR TECHNOLOG??? ?) OR HITECH? OR BIOMED? OR MEDICAL OR BIO()(MED OR MEDICAL)
S7	393831	S5:S6(3W)(DATA OR INFORMATION OR NPL OR DISSERTATION? OR LITERATURE OR MONOGRAPH? OR PUBLICATION? OR ARTICLE? ?)
S8	33023	S5:S6(3W)(BOOK? ? OR TEXT? ? OR TEXTUAL OR TEXTBOOK?)
S9	1273077	MAP OR MAPS OR MAPED OR MAPPED OR MAPING? ? OR MAPPING? ? OR TOPOGRAPH? OR CHART? ? OR CHARTED OR CHARTING? ? OR CHOROGRAPH?
S10	952646	CARTOGRAPH? OR GRAPH OR GRAPHS OR GRAPHIC?
S11	469685	S1:S2(5N)(MODEL??? ? OR MODELL??? ? OR PREDICT? OR FORETELL? OR FORECAST? OR FORE()(TELL??? ? OR CAST??? ?) OR PROSPECT-

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            IVE?)
S12     343182   S1:S2(5N)(ESTIMAT? OR PROGNOS? OR SPECULAT? OR PRESAG??? ?
            OR PROBABILIT? OR VATICINAT? OR FORSEE? OR FORTELL? OR FORCAS-
            T? OR PREVIS?)
S13     369108   S1:S2(5N)(PROPHES? OR PROJECT? ? OR PROJECTED OR PROJECTING
             OR EXTRAPOLAT?)
S14      46570   S1:S2(5N)PROJECTION? ?
S15       7912   S1:S2(3N)S7:S8
S16        816   (S3:S4 OR S15)(S)S9:S10
S17         47   S16(S)S11:S14
S18         22   S17/2002:2004
S19         25   S17 NOT S18
S20         22   RD (unique items)
S21        301   (S3:S4 OR S15)(S)(VISUALIS? OR VISUALIZ? OR VISUAL)
S22         11   S21(S)S11:S14
S23          7   S22/2002:2004
S24          3   S22 NOT (S23 OR S17)
S25          3   RD (unique items)
?
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20/3,K/16 (Item 1 from file: 610)
DIALOG(R)File 610:Business Wire
(c) 2004 Business Wire. All rts. reserv.

00238440 20000321081B7507 (USE FORMAT 7 FOR FULLTEXT)
Philips Semiconductors Adopts HDL-i as Its Preferred IP Generation and Delivery Tool
Business Wire
Tuesday, March 21, 2000 13:17 EST
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 742

...and memories. An important feature of
this combined IP library is the inclusion of Mentor **Graphics** Inventra library
components.
In order to bring the wealth of IP into the hands of...

...which lays down standards and guidelines for IP re-use, now
features an internal business **model** that assigns real monetary **value** to **IP**
depending on its level of re-use and CoReUse compliance -- thereby providing
a real incentive...

20/3,K/17 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
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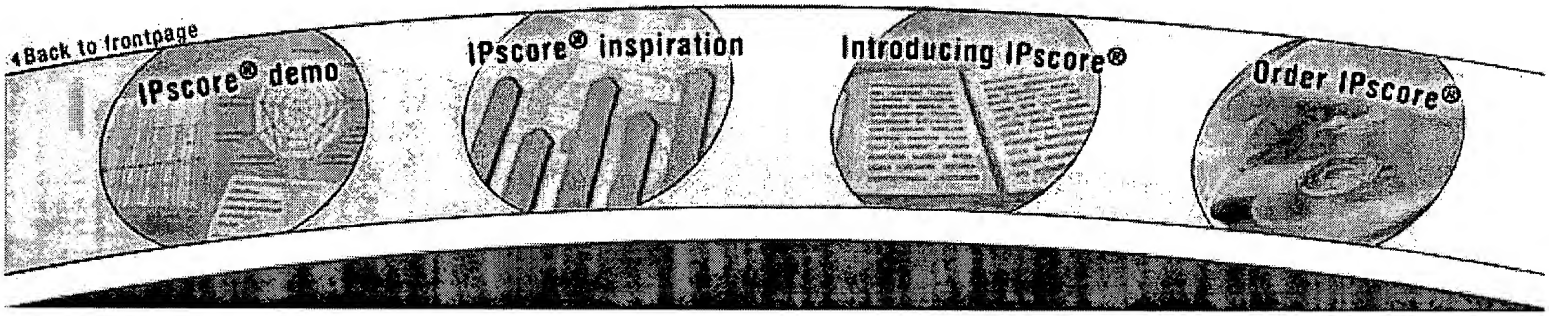
16306830
PR Newswire California Summary, Monday, April 23, 2001 up to 10:00 a.m. PT
PR NEWSWIRE
April 23, 2001
JOURNAL CODE: WPRW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 1309

... REDWOOD CITY) CoSine Communications' IP Service Delivery Platform Selected by Masergy Communications for Delivery of **Value** -Added **IP** Services SFMM01 04/23/2001 07:55 r f bc-NV-Seagate-Rorke (LAS VEGAS...

You are on: Frontpage

Contact
Dansk

DANISH PATENT AND TRADEMARK OFFICE



Overview - value - priority

Unique database software offers brand-new opportunities for documenting the value of patents and development projects. It is an uncomplicated and user-friendly tool, which can be used by all companies with a larger or smaller portfolio of patents and development projects. IPscore® provides your organisation with the notably improved opportunity to

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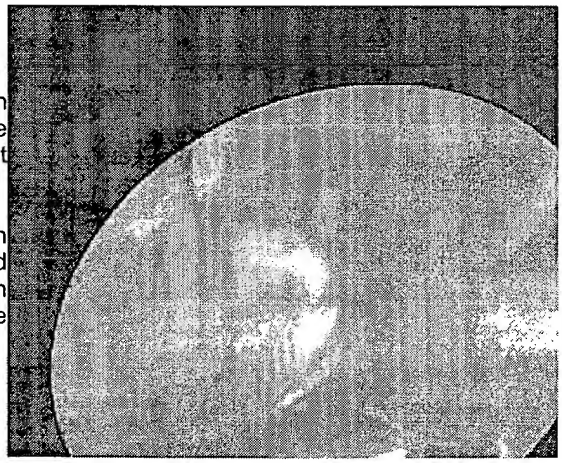

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To learn more>

Wong, Carol

From: Wong, Carol
Sent: Monday, January 29, 2001 8:29 AM
To: [redacted]
Subject: value of IP

Valuation of Intellectual Property and Intangible Assets, 3rd Edition by Gordon V. Smith, Russell L. Parr

Valuing Intangible Assets (Irwin Library of Investment & Finance) by Robert F. Reily, et al

Early-Stage Technologies : Valuation and Pricing (Intellectual Property-General, Law, Accounting & Finance, Management, Licensing, Special Topics) by Richard Razgaitis

Trademark Valuation (Intellectual Property Series (John Wiley & Sons).) by Gordon V. Smith

Value Driven Intellectual Capital: How to Convert Intangible Corporate Assets Into Market Value by Patrick H. Sullivan

"The Value of International Patent Rights"
Putnam, Jon
NBER Spring meetings on R&D, Patents and Productivity.
1997

This paper estimates the value of patent rights held among a large sample of countries by examining the application decisions of inventors. The same methods can be applied to value the portfolios of individual firms.

Intellectual Property Rights in Science, Technology, and Economic Performance: International Comparisons
Rushing, F. W. and C. G. Brown (eds.)
Boulder: Westview Press.
1990

A reasonably balanced look at the role of IPRs in national economic performance. Brown is at NSF; she's not an economist.

R&D, Patents and Productivity
Griliches, Z. (ed.)
Chicago: University of Chicago Press.
1984

A classic collection of the use of patents to estimate returns to research and the contribution of R&D to productivity.

"Patent Statistics as Economic Indicators: A Survey,"
Griliches, Z.
Journal of Economic Literature, 1990, 28: 1661-1707.

Summarizes a very large number of empirical studies that use patent counts in conjunction with other economic data to infer the performance of firms, industries, and national economies.

"Appropriating the Returns from Industrial Research and Development."
Levin, R., A. Klevorick, R. Nelson, S. Winter
Brookings Papers on Economic Activity, 1987, 3: 783-820

This article is cited as the source of most "conventional wisdom" about the use of patents (and other mechanisms of earning returns to R&D, such as secrecy) across a large number of industries. Except in a few industries, such as pharmaceuticals, patents are not cited as the most important mechanism.

"Patents as Options: Some Estimates of the Value of Holding European Patent Stocks"

Pakes, A.
Econometrica, 1986, 54: 755-84.

A technically very demanding article that computes the value of patent rights held in Germany, France and the U.K. It won the Ragnar Frisch award for the best paper in Econometrica during the previous 5 years. Its methods are still state-of-the-art.

Impacts of the Japanese Patent System on Productivity Growth
by Keith E. Maskus and Christine McDaniel
http://patch.colorado.edu/Economics/research/wkpapers99.html

Legal Features of the Japanese Patent System and Impacts on Technology Diffusion
by Christine McDaniel
http://patch.colorado.edu/Economics/research/wkpapers98.html

File 347:JAPIO Nov 1976-2004/May(Updated 040903)
(c) 2004 JPO & JAPIO
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200458
(c) 2004 Thomson Derwent
File 348:EUROPEAN PATENTS 1978-2004/Sep W01
(c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20040909,UT=20040902
(c) 2004 WIPO/Univentio

Set	Items	Description
S1	17	AU=GRUNE G?
S2	11	AU=PLANTE D?
S3	17	AU=TSANG Y?
S4	39	S1:S3
S5	2026077	WORTH? OR VALUE? ? OR VALUATION? OR VALUING OR PARVALUE? OR MARKETVALUE? OR STREETVALUE? OR FACEVALUE?
S6	5930	S5(5N)(PATENT? OR IP OR INTELLECTUAL()PROPERT?)
S7	3	S4 AND S6

7/9/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015178388 **Image available**
WPI Acc No: 2003-238918/200323
XRPX Acc No: N03-190420
Computer system searches, retrieves and stores information, regarding intellectual property within technology exchange in and from respective databases for valuing **and modeling of** intellectual property **according to user**
Patent Assignee: GRUNE G L (GRUN-I); PLANTE D R (PLAN-I); TSANG Y S (TSAN-I); EPATENTMANAGER.COM (EPAT-N)
Inventor: **GRUNE G L ; PLANTE D R ; TSANG Y S**
Number of Countries: 100 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 20030004936	A1	20030102	US 2001896238	A	20010629	200323	B
WO 200303254	A1	20030109	WO 2002US20601	A	20020627	200323	
AU 2002312612	A1	20030303	AU 2002312612	A	20020627	200452	

Priority Applications (No Type Date): US 2001896238 A 20010629
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20030004936	A1		13	G06F-007/00	
WO 200303254	A1	E		G06F-017/30	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW

AU 2002312612	A1		G06F-017/30	Based on patent WO 200303254

Abstract (Basic): US 20030004936 A1
NOVELTY - The information regarding intellectual property is searched, retrieved and stored within technology exchange in and from problem solving database, science and engineering database for **valuing** and modeling of **intellectual property** , according to search criteria specified by user.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for

computer implemented method for enabling optional instantaneous review of data file.

USE - Computer system.

ADVANTAGE - Enables user to obtain information vital to determine the content value and direction of current and future specific technology trends easily, quickly and accurately, by modeling intellectual property according to user.

DESCRIPTION OF DRAWING(S) - The figure shows a programming logic scheme for processing information regarding intellectual property on computer system.

pp; 13 DwgNo 1/5

Title Terms: COMPUTER; SYSTEM; SEARCH; RETRIEVAL; STORAGE; INFORMATION; INTELLIGENCE; PROPERTIES; TECHNOLOGY; EXCHANGE; RESPECTIVE; INTELLIGENCE; PROPERTIES; ACCORD; USER

Derwent Class: T01

International Patent Class (Main): G06F-007/00; G06F-017/30

File Segment: EPI

Manual Codes (EPI/S-X): T01-J05B3

7/5/2 (Item 1 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

01550130

SIMULTANEOUS INTELLECTUAL PROPERTY **SEARCH AND** VALUATION **SYSTEM AND METHODOLOGY (SIPS-VSM)**

RECHERCHE SIMULTANEE EN PROPRIETE INTELLECTUELLE ET SYSTEME ET METHODOLOGIE D'EVALUATION (SIPS-VSM)

PATENT ASSIGNEE:

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PATENT (CC, No, Kind, Date): WO 2003003254 030109

APPLICATION (CC, No, Date): EP 2002740001 020627; WO 2002US20601 020627

PRIORITY (CC, No, Date): US 896238 010629

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G06F-017/30

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 030305 A1 International application. (Art. 158(1))

Application: 030305 A1 International application entering European phase

LANGUAGE (Publication,Procedural,Application): English; English; English

7/5/3 (Item 1 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

00974203

SIMULTANEOUS INTELLECTUAL PROPERTY **SEARCH AND** VALUATION **SYSTEM AND METHODOLOGY (SIPS-VSM)**

RECHERCHE SIMULTANEE EN PROPRIETE INTELLECTUELLE ET SYSTEME ET METHODOLOGIE D'EVALUATION (SIPS-VSM)

Patent Applicant/Inventor:
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Patent and Priority Information (Country, Number, Date):
Patent: WO 200303254 A1 20030109 (WO 0303254)
Application: WO 2002US20601 20020627 (PCT/WO US0220601)
Priority Application: US 2001896238 20010629
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: G06F-017/30
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 7639

English Abstract
A system, method, and computer-based logic flow for a web-enabled tool that allows simultaneous intelligent searching, knowledge management based problem solving, **valuation** , and modeling of **intellectual property** and scientific information are described herein. The system accesses databases of intellectual property and scientific information. Additionally, the computer-based logic flow utilizes valuation techniques based on the Blach-Sholes Options Pricing model or discounted cash flow methods. Such access may be obtained through a wireless technology with an operating system designed to utilize the SIPS-VSM tool.

French Abstract
L'invention concerne un systeme, une methode, et un flot logique informatise destines a un outil mis en oeuvre par Internet qui permet d'effectuer une recherche intelligente simultanee, une gestion des connaissances fondee sur la resolution de problemes, une evaluation, et une modelisation de donnees de propriete intellectuelle ou scientifiques. Le systeme accede a des bases de donnees de propriete intellectuelle ou scientifiques. En outre, le flot logique informatise met en oeuvre des techniques d'evaluation fondees sur le modele d'etablissement des prix d'options de Blach-Sholes ou sur les methodes de l'actualisation des flux de tresorerie. Cet acces peut s'effectuer par une technologie sans fil a l'aide d'un systeme d'exploitation concu pour utiliser l'outil SIPS-VSM.

Legal Status (Type, Date, Text)
Publication 20030109 A1 With international search report.
?

Text Only
Frames
Web TOC

On-line Library of Information Visualization Environments

Temporal
1-D
2-D
3-D
Multi-D
Tree
Network
Workspace

All Citations
All Projects
All Products
All Videos

Welcome to OLIVE, the On-line Library of Information Visualization Environments! Listed to the left are eight categories of information visualization environments differentiated by data type. Within each category we have gathered what we feel are the most important citations, commercial products, research projects, and videos. This web-site is a class project for Dr. Ben Shneiderman's fall 1997 CMSC 828/838S graduate course on Information Visualization at the University of Maryland, College Park, Department of Computer Science.

Dr. Shneiderman originally proposed a taxonomy of information visualization environments in his paper, The eyes have it: A task by data type taxonomy of information visualizations (A Text Only version is available as well). Following this taxonomy, Chris North assembled a reference set which he titled, A Taxonomy of Information Visualization User-Interfaces. Building on that original reference set, and Dr. Shneiderman's recent book, Designing the User Interface (3rd Edition), our class has attempted to update, expand, and annotate Chris North's original page.

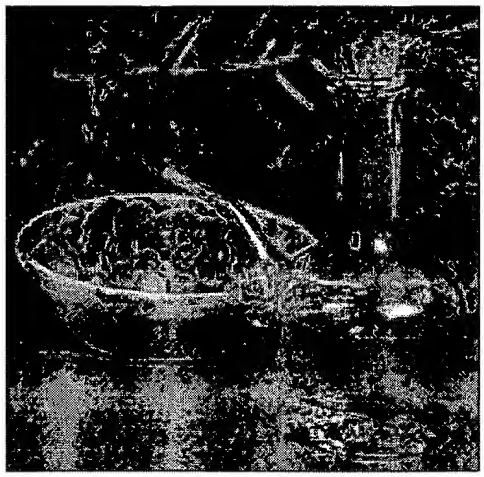
Modern visual environments often go much further than just viewing static data -- dynamic and flexible user control are becoming more of a reality, and possibly a necessity. The day of text-based interfaces and lists of data may be fading. Though each group has attempted to outline both the positives and negatives of the environments they found, one useful general criteria suggests itself when evaluating all the environments. Dr. Shneiderman's mantra, "Overview first, zoom and filter, then details on demand," provides an excellent framework which can apply to all environments. By applying such concepts, we can proceed on the journey to environments that empower users to deal with more complex data and tasks.

We provide several approaches to viewing our site with the idea of illustrating a few of the approaches available for visualizing information presented on the web. Specifically, we offer a traditional Graphics & Text interface, a Frames interface, a Text Only interface, and a WebTOC interface. To avoid duplicate data that can become inconsistent between interfaces, we dynamically rebuild the entire web-site whenever changes are made to the input files for the site. A detailed report on this process is available at: http://otal.umd.edu/Olive/Report.html.

-Michael Reed (reed@cs.umd.edu) & Dan Heller (djheller@wam.umd.edu), Editors.

Humorous Olive links:

- U.C. Fruit & Nut Research and Information Center
- Olive Fact Sheet
- Olive Produce Facts
- Olive Physiological Disorders
- Olive Crop Sheet
- An Ode to Olives



Web page hits since 11/26/97: 050295

Last modified: Sun Sep 28 20:46:33 EDT 1997 - reed@cs.umd.edu

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VOLUME 26 • NUMBER 3 • MAY/JUNE 2002

• FEATURE •

The Hype Over Hyperbolic Browsers

by Maryellen Mott Allen

Retrieving information has become much easier over the past 2 decades, facilitated by increasing numbers of electronic databases and by search engines that provide users with the kind of flexibility unimaginable in the days before online indices and catalogs. And yet, along with the accolades come numerous complaints about the very same technologies that have made the information industry such a quickly growing field. The typical diatribe includes a litany of complaints including unfriendly interfaces, the absence of intuitive search structures, and the requirement that users learn special languages or conventions in order to interact effectively with the online systems. Responding to these concerns, database and software companies have produced a myriad of user interface designs, each trying to out-do the other in terms of power and scope as well as user-friendliness.

Rather than the user population embracing these efforts, however, complaints about usability in the human-computer interaction aspect of information retrieval have intensified. This trend owes its existence to the inordinate number and variety of interfaces out and about these days. Or perhaps the trend lies in simple human nature: We love to find fault with things. One alternative explanation that might be worth considering is that the conflict between users and information interfaces has, at its root, a biological component.

SO MUCH DEPENDS ON RED

With the exception of those who are visually impaired and must rely upon their other senses, humans are visual creatures who can process an image and interpret it much more quickly than reading text. Indeed, people will more quickly perceive and process a photograph of a red rubber ball sitting in a field of green grass than they will the sentence, "There is a red rubber ball sitting in a field of green grass." When looking at the photograph, understanding is almost instantaneous. With the sentence, it takes a longer period of time to read the words, interpret their meaning, and create a visual image in the mind's eye.

This fact has not been lost on those responsible for interface design and information organization. What has resulted is a growing interest in the area of information visualization and its application to the information industry in terms of information structures that provide users with an alternative method of retrieving data using visual cues rather than text, or a combination of an underlying graphical structure with a textual component.

DEFINING INFORMATION VISUALIZATION

The User Interface Research Group at PARC (Palo Alto Research Center Inc.) **[http://www.parc.xerox.com/istl/projects/uir/projects/InformationVisualization.html]** defines information visualization as "the use of computer-supported interactive visual representations of abstract data to amplify cognition." Got that? In more mundane language, it means that computer generated images are used to represent abstract concepts in a search result set. What's more, users can move these images around in various arrangements to gain a better understanding of the abstract concept being represented.

Information visualization became a hot topic in the early 1990s—not surprising since it corresponds roughly with the rollout of the first graphical Web browser, Mosaic. Shortly thereafter, libraries began offering Web-based resources such as online catalogs and article databases. As general users began interacting more frequently and independently with online interfaces, concerns over usability and human-computer interaction with respect to data organization became of primary importance.

ONLINE LIBRARY OF INFORMATION VISUALIZATION ENVIRONMENTS

This is reflected in the vast amount of literature addressing the issue of visual representations of data. Simply running a search in your favorite Web browser (I used Google) will yield enough reading to keep any interested novice busy for a week. One of the leaders in this field, Dr. Ben Schneiderman of the University of Maryland, is responsible (both directly and indirectly) for a great deal of the research that has been reported. The Online Library of Information Visualization Environments (OLIVE) **[http://www.otal.umd.edu/Olive/]** is a wonderful resource for obtaining background information on the types of visual structures and their uses. Users not only have the opportunity to read about the eight structure types listed, but can also follow links to current projects utilizing the technology.

Schneiderman's research was the driving force behind Spotfire **[http://www.spotfire.com]**, a commercial venture that provides data solutions using visualization technologies. Pacific Northwest National Laboratories **[http://www.pnl.gov/infoviz/]** has also contributed a great deal to the body of work, as has the aforementioned User Interface Research Group at PARC.

In all of these instances, it is important to bear in mind that the data itself often takes a back seat to the effort to render this data on a graphical interface. Donald T. Hawkins ("Information Visualization: Don't Tell Me, Show Me!" *ONLINE* 23, No. 1, January/February 1999, pp. 88-90) effectively distills the issue to a simple sentence when he states, "It is important to note that what is being communicated in visualization is not the information itself, but its structure." This is a very valuable distinction to make, as the good intentions of information visualization can sometimes be lost in its implementation.

So how could libraries benefit from the field of information visualization? What type of visual interface would marry well with our organizational traditions? There are as many possibilities as there are ideas. However, consider the hyperbolic information structure—a powerful tool employing hierarchical trees superimposed over an atypical geometry—to offer the user a comprehensive view of a data structure.

HYPERBOLIC INFORMATION STRUCTURE

To appreciate the advantages that hyperbolic structures offer, it helps to have a brief explanation of the methodology used to create a hyperbolic display. It is not as frightening as it sounds, and those readers who have more than a fleeting interest in geometry should excuse this over-simplified explanation. I will concentrate on one particular model of hyperbolic plane mapping known as the Poincare disk model. In a paper published by John Lamping, Ramana Rao, and Peter Pirolli ("Visualizing Large Trees Using the Hyperbolic Browser," *Proceedings of the Conference on Human Factors in Computing Systems*, April 13-18, 1996, Vancouver, British Columbia, Canada **[http://www.acm.org/sigchi/chi96/proceedings/video/Lamping/hb-video.html]**), the authors explain the mapping of a hierarchical tree structure to a hyperbolic display citing two significant qualities of the structure:

- The nodes or components of the tree diminish in size the farther away they are from the center of the display.
- The number of nodes or components grows exponentially from parent to child.

The authors further explain, "The hyperbolic browser initially displays a tree with its root in the center, but the display can be smoothly transformed to bring other nodes into focus... In all cases, the amount of space available to a node falls off as a continuous function of its distance in the tree from the point in the center."

When mapped to a disk, the hyperbolic structure provides an effect that resembles that of the fisheye lens—the amount of room on the display devoted to a point at the center is much greater than the amount of room devoted to points around the periphery. When using this model, there are always several generations of nodes visible, allowing the user to extract a fuller understanding of the hierarchy's structure without getting lost in it. A hyperbolic display contains much more space than a simple Euclidean plane because the circumference and area of the circle it's mapped upon grows exponentially with the length of its radius. The larger the circle, the greater the amount of usable space.

REVOLUTIONALIZING SUBJECT SEARCHING

For libraries, this approach could revolutionize subject searching. Take, for example, the results most of us obtain when we perform a subject search in our regular online catalogs. I executed a subject search for "history" on a Web-based interface running over a LUIS system. The results, of course, were overwhelming and consisted of an extremely long list of subject headings and subheadings (and subheadings of the subheadings) spread across approximately 190 pages, with 25 headings or subheadings per page.

Similar results arose when I performed the same search in other large academic library catalogs using other management systems such as ExLibris and Endeavor. The results from a basic subject search using the term "history" yielded pages and pages of subject headings, with 10 to 25 per page, depending upon the system's settings. Obviously, the term "history" is much too broad to be effective, but based upon empirical data, I believe it accurately represents the searching behavior of the average unassisted library patron. For the average user being inundated with thousands of possibilities, arranged in a linear fashion and distributed among hundreds of screens, information overload is almost guaranteed.

It would be more effective to present the patron with a graphical representation of all pertinent subject headings arranged in a hierarchical tree. Unfortunately, it would be impossible to represent this tree structure in its entirety on a regular graphical interface because such a tree would be much too large to fit on the typical computer screen.

One solution would be to place the structure on a hyperbolic plane and then map it to a two-dimensional circular area. This would allow the user to browse each heading and see how it relates to the other headings in the tree. Because the entire structure is mapped at one time and processed by the computer as a whole, the transitional animation between nodes being brought into focus and those getting dropped off when manipulated by the user is smooth and unaffected by delay. Lamping and colleagues describe this animation technique as a geometric translation of the structure on the hyperbolic plane, which simply means that the entire tree (or structure) is moved along a straight line in whichever direction the user decides to go.

REAL-WORLD APPLICATIONS

To view and interact with an actual example of a hyperbolic browser, take a look at InXight Software's Star Tree navigator **[http://www.inxight.com]**. This is a relatively simple example of a hyperbolic tree structure being used as a site map. To interact with the display, the user can either click once on the node to make it jump to the center, or click and drag the structure around. Double-clicking on any node will open a new browser window that will display the page(s) associated with that area.

Another good example, also by InXight, is The Universal Library **[http://www.ulib.org/webRoot/_hTree/]** hosted by Carnegie Mellon University. This project of the School of Computer Science, which promotes its lofty

goal of "Access to all human knowledge, anytime, anywhere," is a much better illustration of the technology not only because of the current magnitude of the structure (which is great), but also because of the expectation that it will continue to grow as more material is added. However, while this particular case serves as an example of what hyperbolic structures can do for the organization of knowledge, it also effectively demonstrates some of the limitations of the technology in its current state.

Users who select particularly populated sections of the tree and try to move them to the center of the display will notice that the labels crowd each other out, making them impossible to read. And that is not the only drawback associated with these structures. Hyperbolic browsers require a JavaScript-enabled browser such as Netscape or Internet Explorer to operate. At present, sites using hyperbolic trees as navigational tools are really tools that facilitate subject browsing more than true search engines. The processing demands that these applications place on the user's machine can be a serious obstacle for those still using older/alternate operating systems or outdated chip architectures.

Such structures must necessarily include an option for traditional keyword searching. Indeed, hyperbolic trees are wonderful for browsing collections, but quickly become cumbersome to the point of being useless when trying to locate specific documents or pages when the user does not know where in the hierarchy the pages lie.

These applications are also not very compatible with the text readers employed by sight-impaired users, so the blind would find the barriers to using hyperbolic browsers extremely trying, if not insurmountable. These problems can only be solved by the eventual replacement of older systems as they fail with age and the continued development of technologies to assist the disabled. The issue of node crowding, however, has been addressed by another technology that, while employing many of the same navigational conventions as hyperbolic trees, goes a few steps further.

RELATIONAL DATABASES AND HYPERBOLIC TREES

TheBrain Technologies **[http://www.thebrain.com]** is a relational database that uses a similar presentation to hyperbolic trees with some important distinctions. Firstly, the structure, while it is comprised of nodes in a hierarchical tree, is not a hyperbolic structure mapped to a circular display area. Rather, the application displays the primary node in the center (like a hyperbolic browser), with several branches leading to other related nodes. Secondly, each node has the capability of having links to other nodes outside of its particular branch, characteristic of a relational database. Whenever a user selects a particular node, it automatically moves to the center and a new set of nodes relating to the selected one fans out from there. This differs significantly from a hyperbolic browser in that the user is able to see not only the nodes that are members of the same branch, but also any other nodes that might be related. For example, using the Web engine developed by TheBrain Technologies, called WebBrain **[http://www.webbrain.com]**, users can select from sixteen primary subject areas. As an example, I selected computers. Clicking on the "Computers" node moves it to the center and a wide variety of other subjects relating to "Computers" fan out around the display. At all times, the node clicked on to move to the next level down remains situated above the node currently being explored to allow the user to backtrack without getting lost.

Another navigational aid involves the use of mouseovers to highlight the connections between nodes. Choosing "Computer Science" as the next subject area down from "Computers" provides 23 more navigational options. Moving the mouse over each node highlights its connection with the originating "Computers" node as well as any other relationship with which the selection is associated.

WebBrain also incorporates a more traditional keyword search option on a split screen in recognition of the limitations that subject tree browsing entails. Ultimately, the technology demonstrated by TheBrain Technologies is more sophisticated than the hyperbolic browser.

THE FUTURE OF VISUAL INFORMATION STRUCTURES

Unfortunately, I predict that it is unlikely we will see hyperbolic browsers or visually orientated relational databases replacing traditional search engines any time soon. Current conventions for searching and information retrieval are so ingrained that will take an enormous cultural shift among information professionals to pave the way for graphically oriented search tools.

Studies have shown that users favor retrieval engines employing information visualization techniques over their textual counterparts even though user searching success rates between the two are very similar. And yet, the effort to design interfaces that cater to users' desires rather than to those of the information professional is a constant struggle, usually with the user on the losing side. Indeed, my informal research into the opinions of my colleagues regarding both they hyperbolic structure and the relational database revealed an overwhelming disapproval of both. The most oft-cited complaint with each example was the absence of a sophisticated text retrieval engine with Boolean search capabilities.

On the bright side, information visualization techniques, aided by improvements in processing speed and graphics, are gaining a foothold. Slowly, users are becoming turned on to the advantages that visualization can offer.

Web Sites

Xerox PARC's User Interface Research Group [http://www.parc.xerox.com/istl/projects/uir/projects/InformationVisualization.html].

The Online Library of Information Visualization Environments (OLIVE) [http://www.otal.umd.edu/Olive/].

Spotfire [http://www.spotfire.com].

Pacific Northwest National Laboratories [http://www.pnl.gov/infoviz/].

InXight Software [http://www.inxight.com].

Carnegie Mellon University, The Universal Library [http://www.ulib.org/webRoot/_hTree/].

TheBrain Technologies [http://www.thebrain.com].

TheBrain Technologies WebBrain [http://www.webbrain.com].

Further Reading

Campbell, Jennifer et al. "Introduction and Overview: Visualization, Retrieval, and Knowledge." ***Journal of the American Society for Information Science*****. 50, No. 9 (1999). pp. 790-793.**

Munzner, Tamara and Paul Burchard. "Visualizing the Structure of the World Wide Web in 3D Hyperbolic Space." The Geometry Center, University of Minnesota. [http://graphics.stanford.edu/papers/webviz/]

Fowler, Richard H., Aruna Kumar & Jorge L. Williams. "Visualizing and Browsing WWW Semantic Content." University of Texas-Pan American. [http://www.cs.panam.edu/info_vis/doc_explorer/cetac96.html].

Cole, Bernard. "Xerox Subsidiary Releases Hyperbolic Tree Technology for Licensing—InXight User Interfaces Adds XML to 3-D Web." *Electronic Engineering Times*. No. 1010 (June 1, 1998). pp. 24.

Hawkins, Donald T. "Information Visualization Product Developments." *ONLINE*. 23, No. 3 (May/June, 1999). pp. 96-98.

Hawkins, Donald T. "Information Visualization: Don't Tell Me, Show Me!" *ONLINE*. 23, No. 1. (Jan/Feb. 1999). pp. 88-90.

Lamping, John and Ramana Rao. "Visualizing Large Trees Using the Hyperbolic Browser." Proceedings of the Conference on Human Factors in Computing Systems (April 13-18, 1996). Vancouver, British Columbia, Canada [http://www.acm.org/sigchi/chi96/proceedings/videos/Lamping/hb-video.html].

Pack, Thomas. "Visualizing Information: Visualization Systems Data Management." *Database*. 21, No. 1. (Feb./Mar. 1998). pp. 47-49.

Czerwinski, Mary and Kevin Larson. "Trends in Future Web Designs: What's Next for the HCI Professional?," *Interactions* (Nov./Dec. 1998). pp. 9-14.

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